PAPER TRADE JOURNAL

OCTOBER 10, 1960

Plastic Suction Transfer Fabric Gets Tryout at Japanese Mill

Suitability and Limitations of Using Hardwoods for Newsprint

"Do-It-Yourself"—Calcasieu's $10½ Million Modernization Story

How A Material Handling Concept For Pulpwood Means Big Savings

Editorial Dept.
University Microfilms, Inc.
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DUPLEX BOARD CUTTER
and Air-Controlled
DUPLEX SLITTER

Rugged Construction for 'round the clock operation . . . On the Machine

The DUPLEX CUTTER can be adjusted while in operation for changes in lengths. A special feature also permits adjustment of draw between sections, assuring accurate cutting even when varying sheet conditions occur.

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DISC REFINER

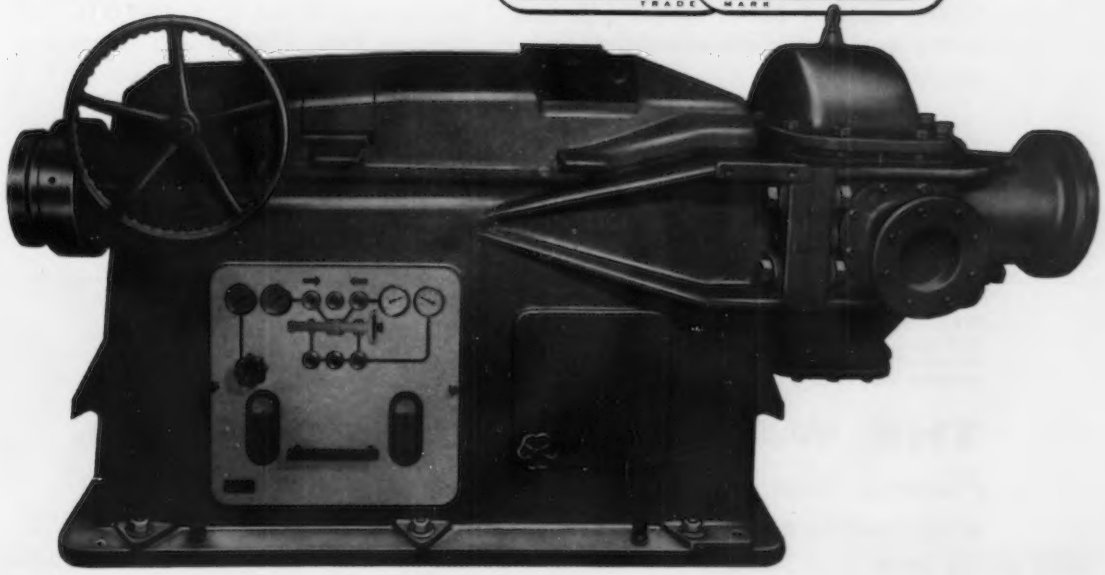
Push Button Precision and rugged construction identify the Raffinator Disc Refiner. The Raffinator is exclusive among disc refiners in having a hydraulic system for accurate, finger-tip control over disc positions at all times. Visual indicator shows plate settings magnified 80 times. Operates also on floating principle to allow for varying stock pressures.

Raffinator Disc Refiners are superbly engineered precision machines for all types of defibrating, and pump through or pressure refining at up to 20% consistency. Operates at speeds of 700-1000 rpm. All parts in contact with pulp stock are stainless steel. Refining discs are available in 24″, 36″, or 50″ diameters — in a variety of types and materials. Extra large shaft diameter prevents deflection in disc settings. Split shell facilitates precision plate adjustment and removal.

The Raffinator is delivered complete with electrical control panel. Even with its many unusual performance features, it is priced competitively with conventional disc refiners. Before selecting a disc refiner, it is wise to investigate the extraordinary advantages found in the Raffinator — already proved in over 600 mill installations.

Raffinator Disc Refiners, product of Swedish design and engineering, are now available in North America through Bolton-Emerson. For full information, contact *The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON
TRADE MARK



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Lengths up to 60 feet. ⅛" to 6⅝" O.D. Wall thickness from .008" to .154" depending upon O.D. and application.

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REMEMBER THESE DATES

October 17-21, National Safety Congress, Conrad Hilton Hotel, Chicago.
October 24-28, TAPPI Engineering Conference, Hotel Robert Meyer, Jacksonville, Fla.

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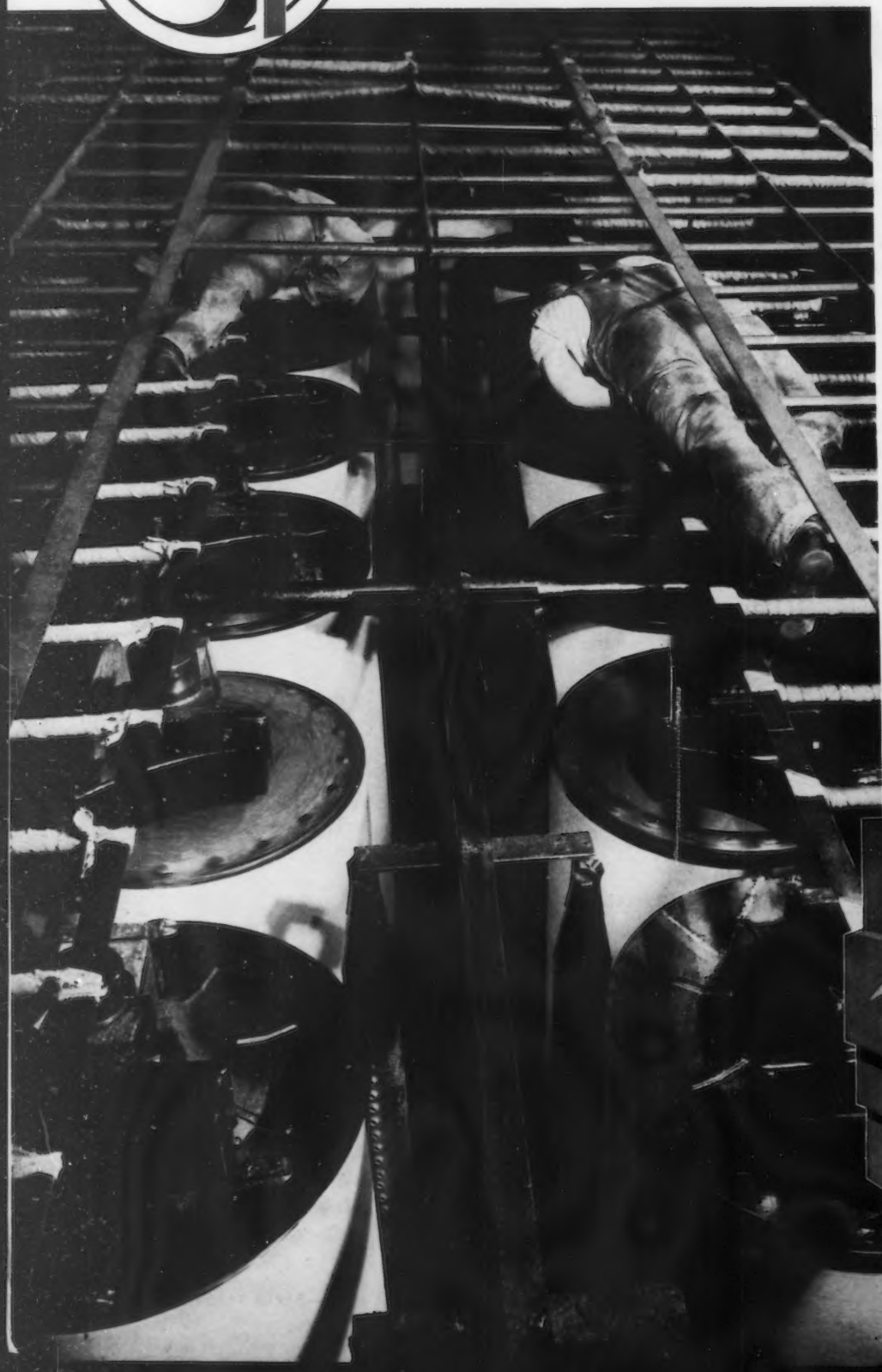


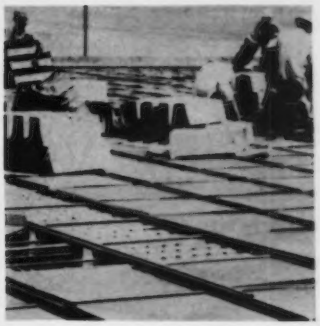
A few of the countless types of Jayhawk cartons made from Fresszurboard, produced on the unique, Huyck-clothed high 'dryer stock multi-cylinder machine shown at left.

with HUYCK to set an ALL-TIME RECORD producing SPECIALTY MEDIUM

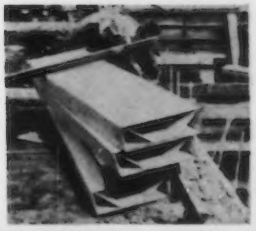
Late last year, skilled papermakers of Lawrence Paper Company, Lawrence, Kansas, scored an all-time record in the production of their celebrated Jayhawk Freezurboard — an exceptionally sturdy, moisture-resistant corrugated medium made from pulp impregnated with a bituminous substance. The uniquely constructed high dryer stack, multi-cylinder machine, running for 454.6 hours, chalked-up a new high of 1,598,939 pounds of paper in a variety of grades — all carried by a Huyck 4-D treated bottom felt, lasting 30% longer than any clothing previously used.

Needless to say, we are proud of the part Huyck plays in helping Lawrence's famous Jayhawk products fulfill their promise to "*carry the load to the end of the road*," a familiar Lawrence slogan that also expresses the sentiments of Huyck feltmakers.

JAYHAWK FREEZURBOARD FORMS PRODUCED BY LAWRENCE PAPER COMPANY'S CONSTRUCTION DIVISION.



JAY-PANS - forming medium for concrete construction.



JAY-VOIDS — asphalt-impregnated corrugated forms.

Huyck Felt Co.,
Rensselaer, N. Y.
Aliceville, Ala.;
Division of Huyck Corporation.
In Canada: Kenwood Mills Limited,
Arnprior, Ontario.

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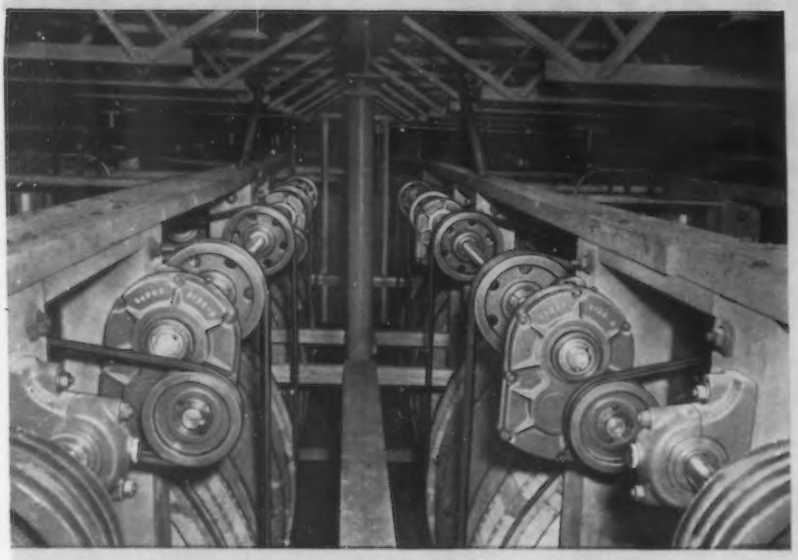


DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Install it anywhere—with minimum time and effort. Here is an overhead installation on tanning drums. Torque-Arm reducers are resistant to acid fumes, salt water environment, moisture.

DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Can be positioned any place on the entire length of the shaft. It locks into place on *both* sides of the housing. Note modified torque arm on this installation on a mixer in a beverage plant.

The Speed Reducer Idea that

Two things account for the record popularity of Dodge Torque-Arm Speed Reducers. First, they cost less to install since they require no foundations, sliding motor rails or flexible couplings. Second—and most important—these modern reducers as developed by Dodge perform *brilliantly*. Tens of thousands of installations underscore Torque-Arm dependability. Torque-Arm is America's *quality* shaft mounted speed reducer!

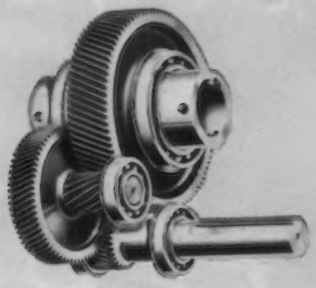
Torque-Arm has been so extensively adopted by industry that today models are available for a vast range of applications. The Torque-Arm line offers you capacities up to 170 hp—output speeds from 10 to 400 rpm—in single and double reduction series—with 5 to 1, 15 to 1 and 25 to 1 ratios. Models for vertical or inclined shaft operation are available—as well as special-application versions such as flange mounted, right

Rugged semisteel housing— a solid backbone for solid service

Here is a tough, corrosion-resistant housing with the strength to hold bearing seats in line for the life of the unit. Perfect shaft and gear alignment are assured by doweling the matched halves together and boring in line. No gear is overhung. Loads are carried easily, contributing to Torque-Arm's long life and high efficiency—97% in double reduction models, almost 99% in single!

AGMA rated gears— quality-guarded by continual tests

These helical gears have soft cores to withstand shock—and hardened surfaces to resist wear. Their quality is guarded in manufacture and assembly by the most modern methods of quality control, including inspection for runout, tooth spacing, helical lead and involute profile. They run quietly, mesh precisely. Teeth are crown shaved for maximum contact area. Gears are shrunk on their shafts to prevent shifting.



Modern double-lip seals keep oil in and dirt out

Modern synthetic, double-lip seals of the highest quality keep oil in and dirt out of the reducer case. These seals offer protection for the unit from dust and dirt and just as effectively insure cleanliness when operating in laundries, textile mills, food processing plants.

Re-ally Clicked!

angle and extended input shaft styles. Optional equipment includes a positive, sealed-in backstop and a positive overload release.

Ask your local Dodge Distributor. Or write us for our 64-page Torque-Arm Speed Reducer Bulletin, complete with engineering data and easy selection tables.

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Paper makers have always known that Northeastern Spruce has unexcelled paper making properties. Now, with WONDERWHITE, you have the forming and printing qualities available only in a spruce sulphite, plus the high brightness which only Chlorine Dioxide can give.

Maybe this pulp is the answer to a number of your problems. May we suggest a trial shipment? You'll soon see why we called it WONDERWHITE.

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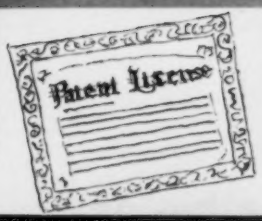

"Enclosing $1.00 — Send Patent License"

Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The $1.00 really does cover it.

Becco has lots of patents, granted as a result of innovations in the use of Hydrogen Peroxide and other Peroxygen chemicals developed in Becco's Research Laboratories. But they don't do us a whole lot of good locked tightly in our safe. So, we long ago adopted the following policy:

If one of our patents can help you, we'll be glad to license the rights to you **perpetually**, for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important — you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

What do **we** get? You as a **customer** — we hope — but there's no obligation on your part. Just seems to work out that way, though — when we know enough about a particular peroxygen to hold a patent on its use, chances are we've also learned enough to produce it purer than anyone else. You benefit from this; we do, too.

Use the coupon below to ask for a Sales Engineer — or our list of patents — that may help you solve an important problem.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
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Gentlemen:

Please send your list of patents available on the use of

- ☐ Hydrogen Peroxide
- ☐ Peroxygen Chemicals
- ☐ Persulfate Chemicals
- ☐ Please have a Sales Engineer call.

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That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level **improves** to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with all types of pulp. If you'd like help with your pulp, free of any obligation, let us know with the coupon below.

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Problems in handling Hydrogen Peroxide

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These new tanks have unobstructed interiors to carry maximum cargo with least danger of contamination—the essential requirements of an order for two independent tank barges from Union Carbide Chemicals Company. One barge is designed to carry Grade A and lower liquids having a Reid Vapor Pressure not exceeding 25 psi. The other barge will carry similar cargoes having a Reid Vapor Pressure not exceeding 40 psi.

American Bridge designed and constructed the tanks and barges at its modern Plate Shop in Orange, Texas. The results: two Jumbo Hopper Barges 195′ x 35′ containing six tanks 52′ long x 14′-6″ O.D. and weighing 22 tons with a total capacity of 383,000 gals. per barge. The reinforcing members for the tanks were placed on the tank exteriors leaving unobstructed nickel-plated interiors.

Whatever your plate needs, we have the staff and facilities to take care of them, and our strategic location permits shipment by train, truck or barge. Write for our booklet completely describing plate fabricating and construction services. *USS is a registered trademark*

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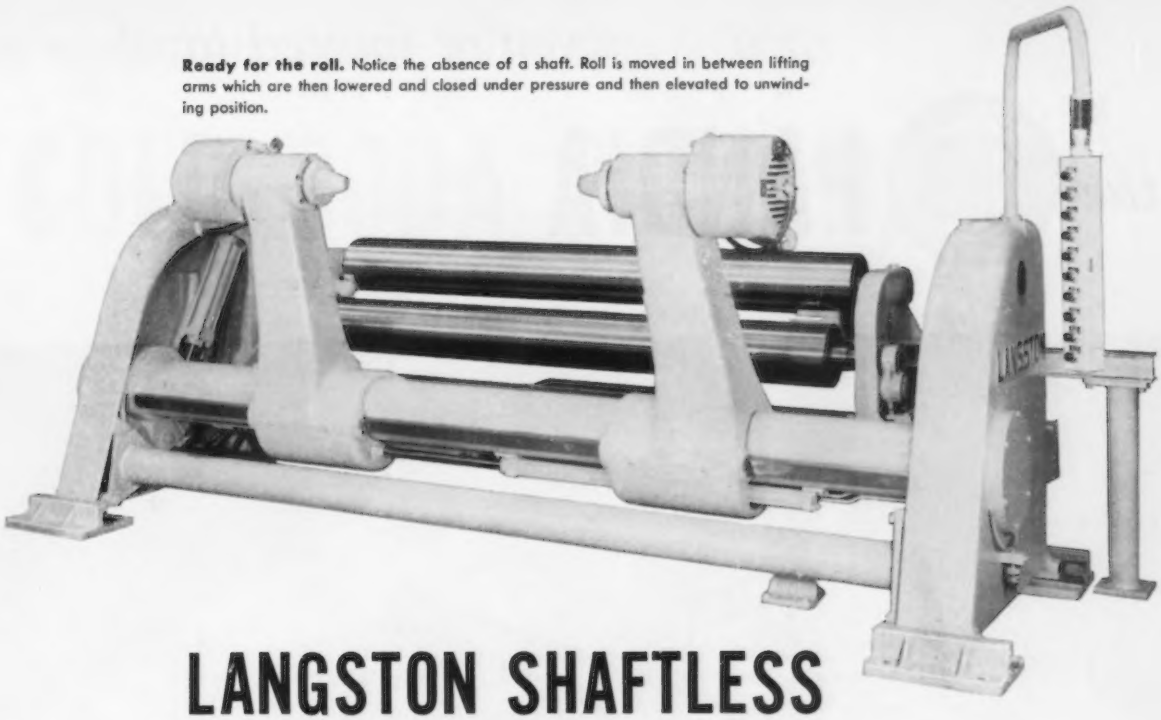
American Bridge Division of United States Steel

Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which are then lowered and closed under pressure and then elevated to unwinding position.



LANGSTON SHAFTLESS UNWIND STAND

Boost your production . . . reduce your slitting and rewinding costs

Easy, fast, completely safe. One man does everything. Operating push-button controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston standard shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by push-button control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 36 to 140 in. and diameters from 14 to 84 in. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

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you're invited to come to

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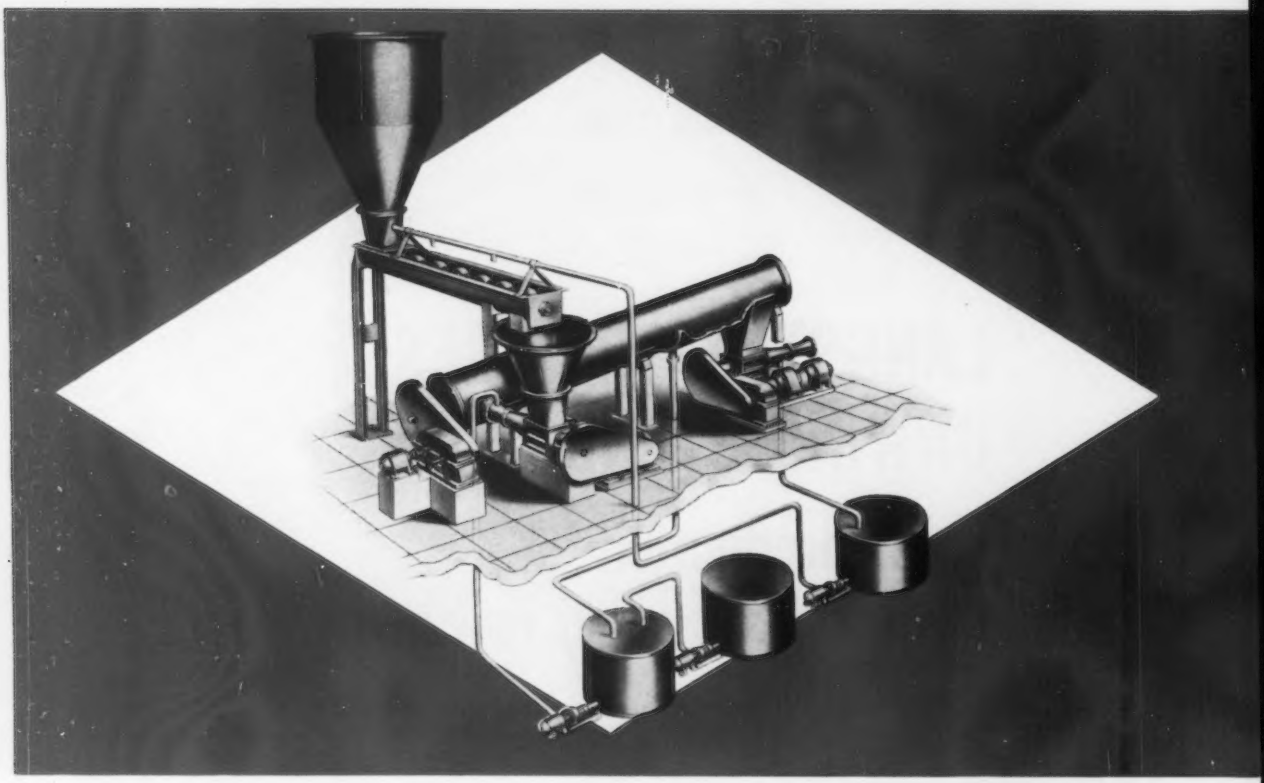


The ChemPreg Cold Soda System is a two-stage, low power process involving

1. The treatment of wood chips or other fibrous materials with a relatively strong alkaline agent, usually caustic soda, at room temperature with induced penetration.
2. Subsequent defibering by mechanical action.

ChemPreg Cold Soda Pulping offers these advantages

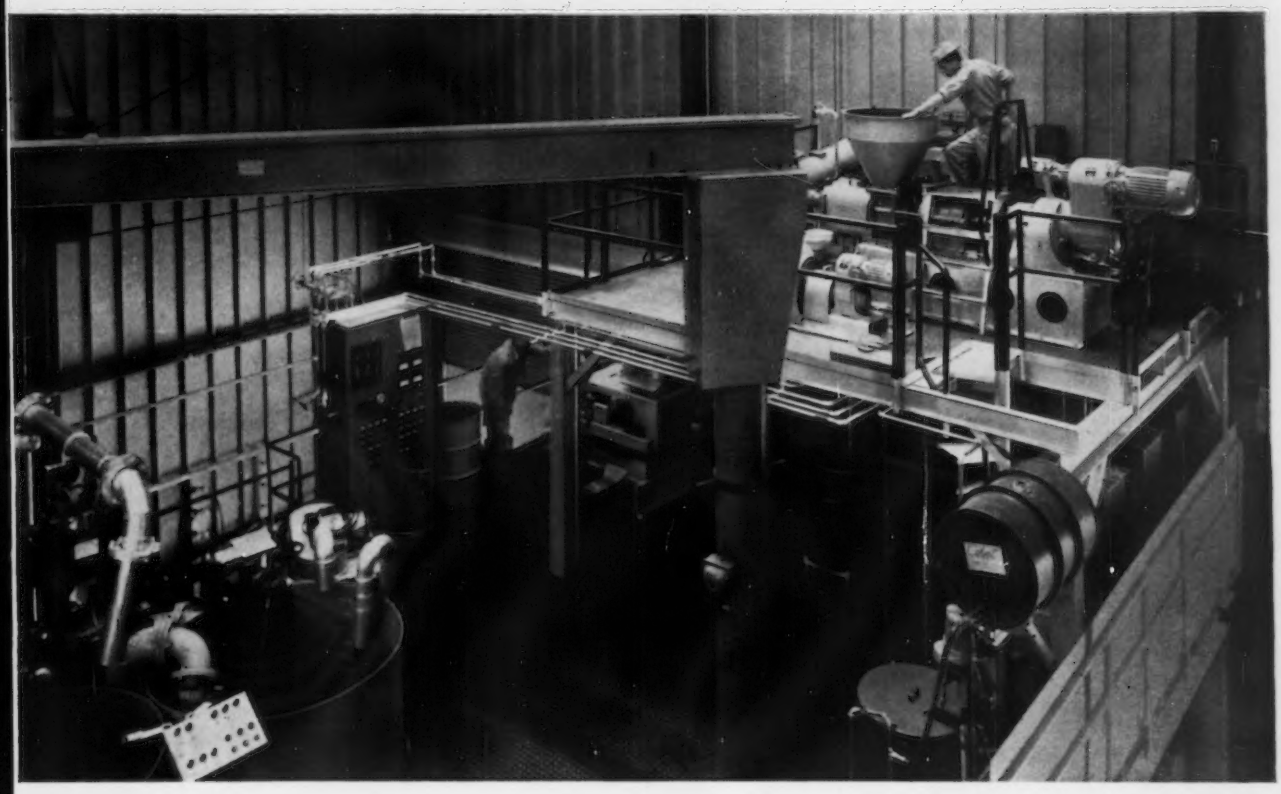
1. Use of locally available hardwoods, waste wood or agricultural fibers.
2. It can replace higher priced groundwood pulp or chemical fiber.
3. Low installation cost per ton of pulp—no steam plant needed.
4. Compact system can frequently be added to existing pulp mill without modifying the building.
5. Flexibility—makes a great variety of pulps just by varying conditions.

Applications: Supplements filler pulps, groundwood and chemical hardwood pulps. Is used in news, printing, tissue, toweling, food and other boards, corrugating medium, insulating board and other grades.

*Trademark

middletown, ohio, and investigate

COLD SODA PULPING *System*



ChemPreg PILOT PLANT

This new one ton ChemPreg pilot plant system, located at the Black-Clawson Research Center in Middletown, Ohio, is used to duplicate and evaluate results which can be obtained in a commercial installation. The pilot plant is available to you for demonstration or for test work on your own pulping problems.

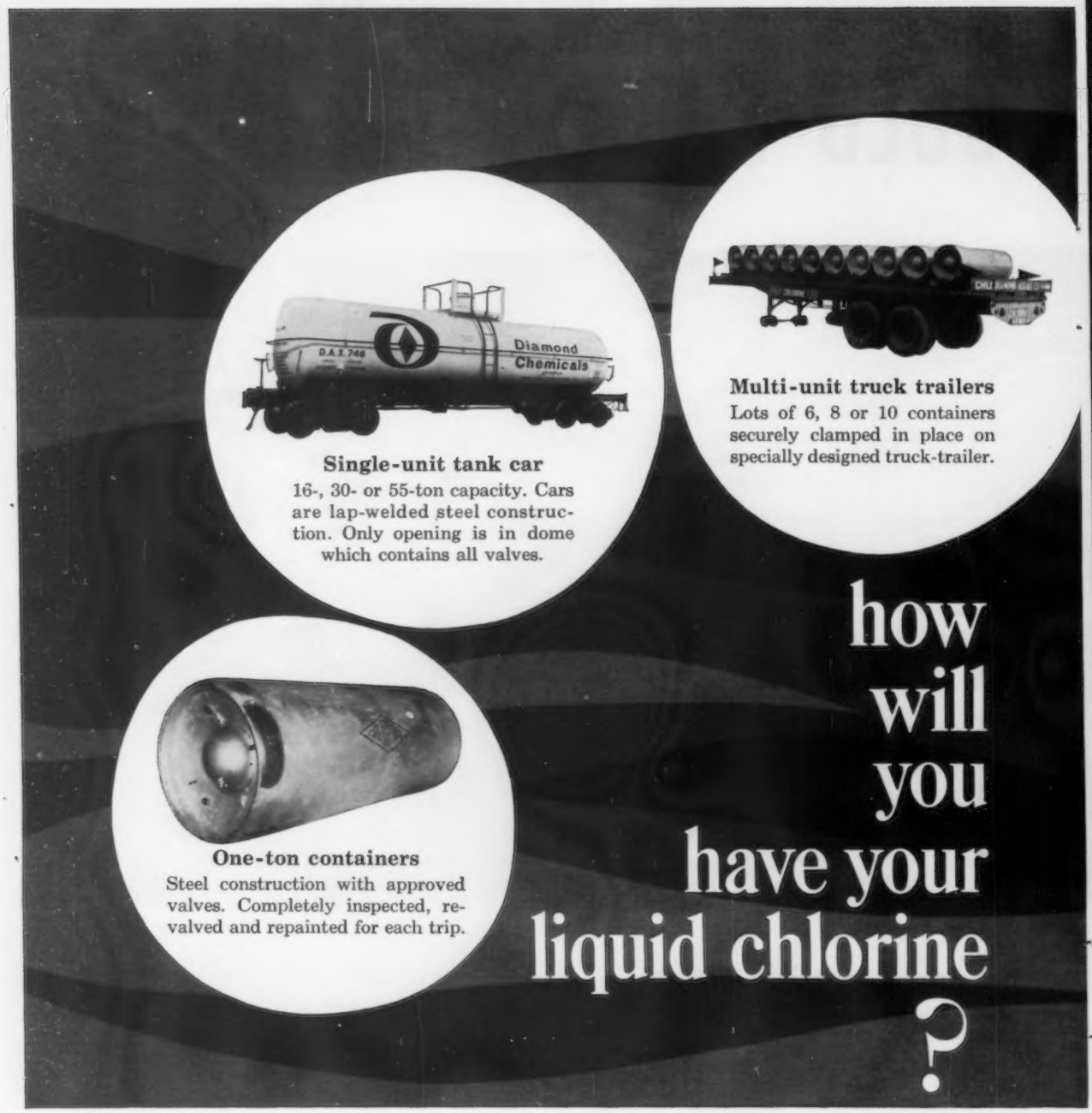
We invite you to visit us, make use of this pilot plant facility and learn how ChemPreg Cold Soda can benefit your company. To make arrangements please contact:

The Black-Clawson Company
Pandia Division, Middletown, Ohio— GArden 2-4561

Bulletin PC-22 describes, illustrates the Pandia ChemPreg System. Write for a copy today.

Co-ordineered Pulp Mill Equipment

BLACK-CLAWSON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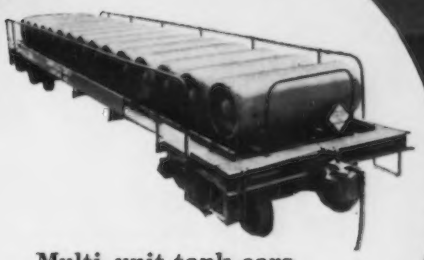

Multi-unit tank cars

Transports 15-ton containers, securely clamped in position. Freight paid only on the chlorine—a big saving.

100- or 150-lb. cylinders

Seamless steel construction, fitted with I.C.C. approved valves. Each is inspected, re-valved and repainted for each trip.

From Diamond, you get Liquid Chlorine where you want it . . . when you want it . . . in the quantities you want . . . at the lowest shipping cost . . . safeguarded by the most highly skilled technical service. You'll always be glad you're doing business with Diamond, one of America's largest producers. For the Diamond "Chlorine Handbook", write Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

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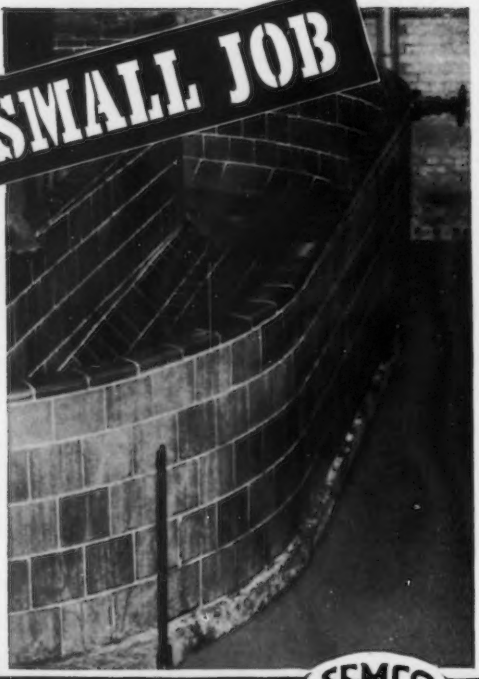
SMALL JOB



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and Servicing
of Linings and
Tile Tanks

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Now Cyanamid brings you

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Retention Aid

the finest retention aid on the market today†

*TM American Cyanamid Company †Based on controlled evaluations.

here's visual proof of pigment-saving

accurac* 24

Retention Aid

SQUARE #1 – 0

SQUARE #2–.25 lbs. per ton

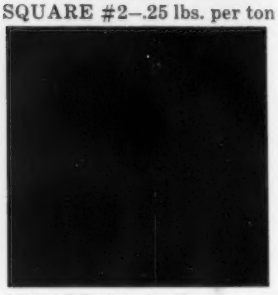
SQUARE #3–.5 lbs. per ton

SQUARE #4–1.0 lbs. per ton

SQUARE #1 – 0

SQUARE #2–.25 lbs. per ton

SQUARE #3–.5 lbs. per ton



SQUARE #4–1.0 lbs. per ton

Each block contains equal amounts of blue or yellow pigment. The ACCURAC 24 content varies from zero to 1.0 pounds per ton of paper as indicated. Color specifications may be maintained by adding ACCURAC 24 in appropriate amounts while reducing the amount of pigment added to the stock. Or, additions of ACCURAC 24 to a given amount of pigment will intensify the final color.

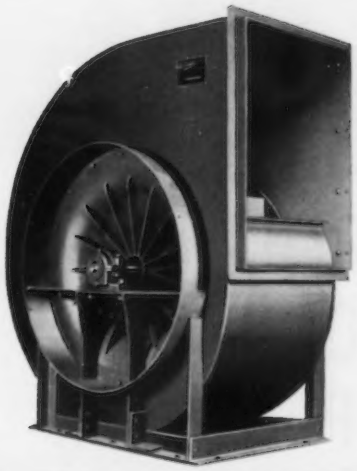
Note the advantages of ACCURAC 24! Aids retention of fillers and costly pigments such as TiO_2 and colored pigments. Same color specifications with less pigment added. Retention of fines for improved formation of the sheet. Less fines in white water. Less load on save-alls. Less 2-sidedness in colored paper. Faster machine drainage. ACCURAC 24 is being successfully used in the paper industry to improve the retention of fines and pigments. For full information, send for Cyanamid's data sheet on ACCURAC 24.

CYANAMID

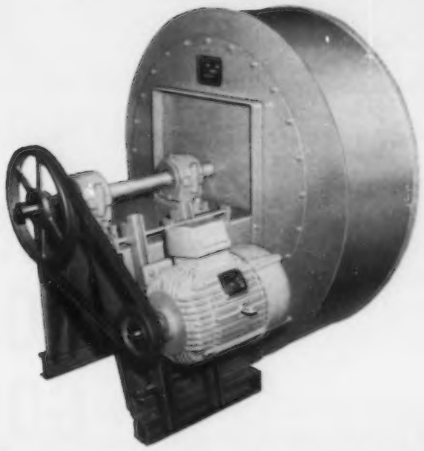
AMERICAN CYANAMID COMPANY • PAPER CHEMICALS DEPARTMENT, 30 Rockefeller Plaza, New York 20, N.Y.

Realize the Lower Cost of Quality Fans

"Buffalo" Type "CR" Fan



"Buffalo" Type "BL" Fan



"Buffalo" Industrial Exhauster

Without a doubt — the dependable performance of quality built fans pays off in longer, more effective, trouble-free service. At Buffalo, we call this the "Q" factor . . . the highest quality you can get. Here are 3 examples of what this can mean to you . . .

For supplying moderate pressure ventilating, air conditioning and air cleaning systems, the "Buffalo" Type "BL" Fan is ideal. From inlet through wheel to housing, the "BL" is engineered for quiet, efficient, economical operation. The "Buffalo" designed non-overloading characteristic assures stable output from free delivery to shutoff. Buffalo's traditional durable construction assures long, maintenance-free life. Capacities to 500,000 cfm. Write for Bulletin F-104.

For severe industrial service the "Buffalo" Type "CR" Fan is unsurpassed. Fan efficiency is increased by the same design factors that reduce wear to a minimum. A unique radial blade plus maximum streamlining through the entire fan accomplishes this dual purpose. Long, productive fan life is assured by Buffalo's extra-heavy duty construction throughout. For full details, write for Bulletin FD-205.

For rugged air and material moving jobs you can rely on "Buffalo" Industrial Exhausters. Special units will move hot gases from 200° F. to 850° F. For handling corrosive fumes, actual users prove that "Buffalo" Rubber-Lined Exhausters will outlast standard metal fans as much as twelve to one. Efficient material wheels are available for moving emery dust, saw dust, chips, long shavings and many other materials. There's a "Buffalo" Industrial Exhauster to fit your "tough" application. Write for Bulletin FI-110.

For full information on these and every type "Buffalo" Fan, call in your nearest "Buffalo" Representative. Or write us direct, outlining your air moving problems.

"Buffalo"

BUFFALO FORGE COMPANY

Buffalo, New York

Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.

Buffalo Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

Stevens one-man finished skid stacking, seen in the background.

TRIMMER PRODUCTION GOING UP

with stevens instantaneous unstacker and trimmer loader

This simple, fully automatic, economical machine operating at a trimmer will pay for itself in less than a year by cutting labor in half, at the same time doubling production over outmoded "unstackers" and laborious trimmer loading.

It automatically unstacks lifts of sheet paper or board in any size, weight, grade or finish from a skid and delivers the lifts completely onto the trimmer table at either side or front... or, onto any other table or conveyor, in one instantaneous, continuous stroke, at the touch of a button. Operates "slick as a whistle," repeatedly, day in—day out, without fuss or bother and without missing or damaging a sheet of paper.

No limitations—install anywhere—unstack from any skid of paper and deliver the lifts anywhere desired—fully automatic—no helper—one man, trimming continuously—no lost motion—no waiting—no lifting—no fatigue—no separate equipment to unstack and load the trimmer—simply push a button at the trimmerman's finger tips and the whole job of unstacking and trimmer loading is done in less time and effort than it takes to say it.

SEE ALL THE MONEY-SAVING ACTION IN MOTION PICTURES, TAPPI ENGINEERING CONFERENCE • JACKSONVILLE, FLORIDA OCTOBER 23rd to 26th, SUITE 1836-37 ROBERT MEYER HOTEL

CHARLES R. STEVENS, Inc. 501 West Sophia Street Maumee, Ohio MAumee 3-8719

Trends

Mill Operating Rates Off Slightly

Paper mills ran about 92% of capacity during the last three weeks of September and board mills at 93%. We omit the first week of September because Labor Day artificially deflates the operating figure.

Fine & Wrapping Sales Up In August

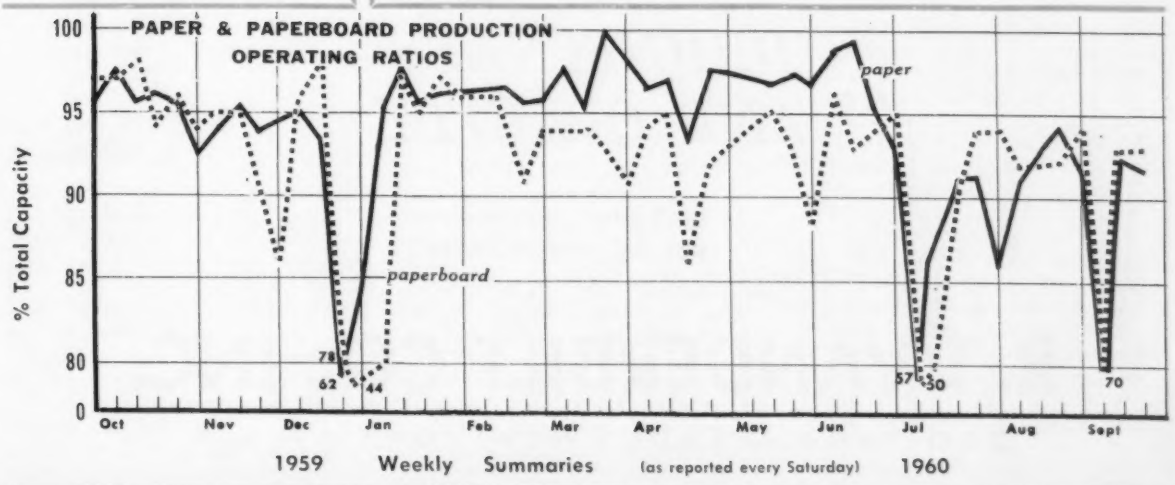
Merchant sales of fine papers in August were nearly 20% above July's low. The increase was nearly double the normal July to August rise according to NPTA. August merchant sales of wrapping paper were 18% over July compared with a normal increase of 5%.

Very Mixed Pulp Import Picture

Pulp import picture for the first seven months compared with the same period last year is as follows. Canada: bleached sulphite, unchanged; unbleached sulphite, —30%; bleached kraft, —4%; semi-bleached kraft, —7%; unbleached kraft, —17%; bleached groundwood, +76%; unbleached groundwood, +15% and soda, +5%. From Europe: bleached sulphite, —17%; unbleached sulphite, +17%; bleached kraft, —44%; semi-bleached kraft, —38%; unbleached kraft, —33%; bleached groundwood, —22%; unbleached groundwood, —54%. It is interesting to note that in a case of a number of grades where the figures are down for Canada they are up for Europe and vice versa. Overall imports from Canada are down 1% for the period and from Europe —25%.

Exports Continue To Lead Imports

While Canada was still far ahead in the lead as the best customer of American exporters in 1959, Japan replaced Mexico in second position—according to a comparative per capita tabulation of exports and imports for 1958 and 1959 compiled by the National Council of American Importers. The table reveals that on a per capita basis, the United States buys only a fraction from most countries of what they buy from us. This in spite of the fact that import trade volume was higher in 1959 than in 1958.



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PAPER TRADE JOURNAL

WEEK OF OCTOBER 10, 1960

Waldorf Begins Production On New Board Machine at Missoula

Kraft board is now being received at the five corrugating plants of Hoerner Boxes, Inc., from Waldorf Paper Products Co.'s mill at Missoula, Mont. Waldorf has had an expansion program under way and recently began production of linerboard on a new Beloit fourdrinier. The machine, designed for production of 350 tons per day, has a 176-inch wire and speed range of 175 to 1750 f.p.m. The machine is a conventional type, and is equipped with a secondary headbox, a Flo-vac unit, breaker stack, size press and double calender stack. As part of the same program, pulp capacity has been doubled, and the mill will continue to supply pulp to the company's operation at St. Paul, Minn.

At present, the Missoula mill produces only five weights of kraft paper, and the Hoerner organization will continue to purchase part of its paper stock from outside mills.

In 1957 Hoerner Boxes acquired a 25 per cent interest in the Waldorf Paper Products Co. pulp mill at Missoula. On June 10, 1959, Hoerner and Waldorf became equal partners, and the mill name was changed to Waldorf-Hoerner Paper Products Co. A multiple stage bleach plant was incorporated into the mill operation this past spring, with drying and baling facilities for 100 tons per day of bleached sulphate pulp.

Hoerner Boxes, whose general office is in Keokuk, Iowa, operates 13 box manufacturing plants in the middle west. A fourteenth plant will be completed next year at Gurnee, Ill.

Tugela Kraft Paper Mills Output To Be Doubled

The South African Pulp and Paper Industries, Durban, plans to double the output of its Tugela Kraft Paper Mills at an estimated cost of $4 million.

A 209-inch-wide paper machine has been ordered and is expected to be in operation by 1963.

Hurlbut Workers Reject Union

Employes at the Hurlbut Paper Co., Lee, Mass., eligible to vote on a proposal that the United Papermakers and Paperworkers, AFL-CIO, be named bargaining agent at the local mills, voted 76-39 recently against having a union.

The figures are based on disclosure by the company that about 55 per cent of the 139 who cast ballots voted against the proposal.

All but three of the 142 workers employed at the plant and eligible to vote did so.

K-C Canada Starts Up New Mill

Kimberly-Clark Canada, Ltd., late in September began operation of its new tissue mill and converting plant at Lancaster, N. B. (a suburb of Saint John). The paper mill with a capacity of about 50 tons per day of facial and toilet tissues will supply the local converting plant as well as one recently built at St. Hyacinthe, Quebec. Pulp is supplied by the nearby Irving Pulp & Paper Co. plant in which Kimberly-Clark owns a substantial interest.

Canada Paper and Pulp Output, Export Top 1959

Canadian paperboard production and exports were ahead in August and the first eight months compared with last year.

Output for the month was 88,167 tons, up from 80,899 tons in August last year when there was one less working day. Production to the end of August was 650,099 tons as compared with 619,453 tons in 1959. Container grades were chiefly responsible for the gain as output increased from 333,713 tons to 369,395 tons in the eight-month period.

Paperboard exports were 7,939 tons during the month (6,387 tons a year ago) and 64,541 tons to the end of August (44,493 tons last year). Canadian consumption was 575,683 tons in the eight-month period (573,042 tons in 1959).

Canadian woodpulp production, domestic consumption, and exports gained in August and the first eight months compared with 1959.

Output in August was 959,232 tons, up from 904,420 tons last year. To the end of the month, production totalled 7,382,780 tons as against 6,953,823 tons in the 1959 period.

August exports were 235,696 tons (199,609 tons in 1959). In the first eight months, shipments abroad were 1,723,976 tons, up from 1,600,819 tons a year ago.

Canadian woodpulp consumption in August, when there was one more working day than in August last year, was 729,192 tons (694,324 tons in 1959). In the first eight months consumption was 5,564,897 tons (5,336,753 tons last year).

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending September 24, 1960 at 91.6 per cent, compared with 93.1 per cent, revised, for the preceding week. The ratio was 97.1 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending September 24, 1960 at 93 per cent, compared with 93 per cent for the preceding week and 97 per cent for the corresponding week a year ago.

(Detailed Statistics on page 73)

PAPER PEOPLE

H. F. Dunning

P. C. Baldwin

Scott Paper Adds Two Vice Presidents

Harrison F. Dunning and Paul C. Baldwin have been elected executive vice presidents of Scott Paper Co. At a meeting recently, Scott's board of directors concurred in the recommendation of Thomas B. McCabe, president of the company, to promote the two vice presidents of Scott to the newly created positions.

All the distribution activities of the company, including retail, industrial, and specialties sales, advertising, sales promotion, and marketing research, in this country and abroad, will be under Mr. Dunning's direction.

All of the manufacturing, engineering, and research and development activities of the company will be under the direction of Mr. Baldwin.

Administrative vice president Andrew J. Schroder, 2nd, will continue to direct and coordinate the service functions including legal, industrial and public relations, treasurer, controller, purchasing, traffic, quality control and office management.

The two executive vice presidents and the administrative vice president will compose the new executive committee of the company, under the direction of the president.

Vice President G. Willing Pepper, in addition to his industrial sales activities with Mr. Dunning, will continue to report to the president on special assignments.

Vice President James L. Madden, in addition to his direction of future planning and the company's timber resources — both of which will be coordinated with Mr. Baldwin's functions — will continue to report to the president on special assignments.

Vice president George Carleton will continue to direct the company's foreign expansion program with the approval of the president and will continue the successful program of coordinating all foreign distribution activities with Mr. Dunning and all manufacturing operations with Mr. Baldwin.

C-Z Promotes Three At Camas Plant

Three promotions in the Crown Zellerbach plant at Camas have been announced by the company. Receiving promotions were Paul Anderson, James L. Golladay and Vaughn Wallace.

Mr. Anderson, senior production planner, has been named assistant production planning supervisor in the tissue section. He has been with the Camas plant 13 years.

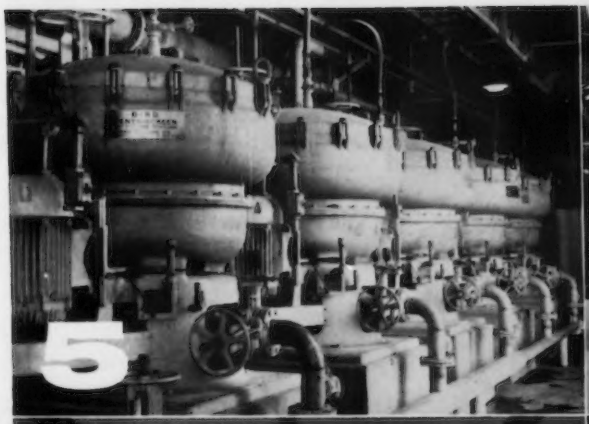
Mr. Golladay has been appointed men's personnel supervisor. He has been transferred from the Antioch division where he was assistant personnel supervisor.

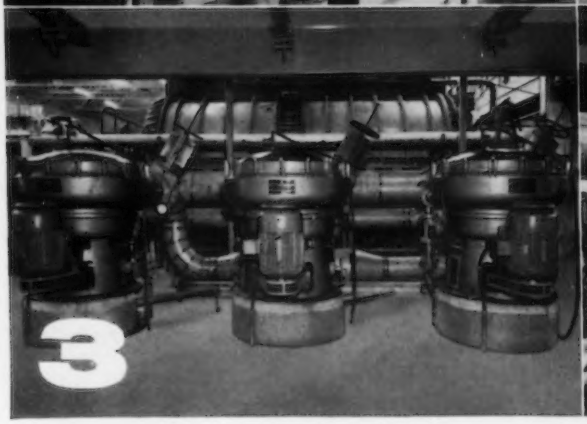
Mr. Wallace has been promoted to shift foreman in the napkin department. He has been transferred from the company's plant in Dresden, Ohio.

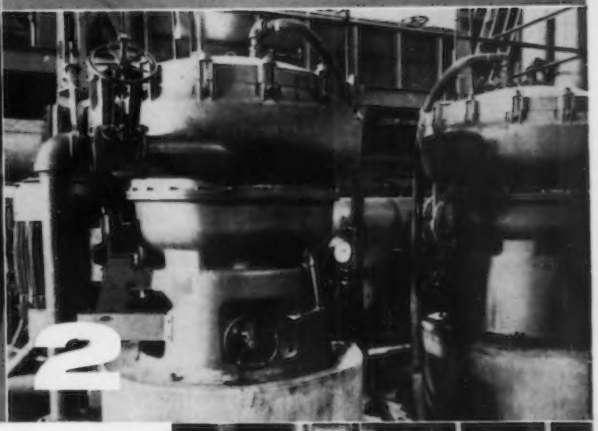
Asst. Secretary Named By Hudson Pulp and Paper

Hudson Pulp and Paper Corp. has elected Warren E. Abrams assistant secretary of the corporation.

Mr. Abrams, who is manager of technical services for Hudson, has held responsible positions in the manufacturing, industrial engineering, and research and development departments since joining the company in 1953. He is a graduate of Virginia Polytechnic Institute, and did graduate work in pulp and paper technology at the University of Maine.







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BIRD CENTRISCREENS

Your stock screening requirements may call for a single Model 6 Centriscreen for 1200 gpm or less, Model 10 for 3000 gpm, or a whole battery of Model 14 Centriscreens, each delivering up to 6000 gpm — but one thing is *sure*, they call for super-efficient, super-dependable Bird Centriscreening.

Ask us to show you what this modern pressure screen can do to:

- **produce uniformly clean, shive-free stock continuously at lowest screening cost per ton**
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- **eliminate lumps and slime**
- **permit faster machine speed**

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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

Two Promotions At Champion Announced

Champion Paper and Fibre Co., Hamilton, Ohio, has announced two promotions.

Lester C. Tincher has been named administrative assistant to the division manager and William E. Wright has been advanced to supervisor of the wage and salary section in the personnel Administration Department.

Brown Co. Board Chairman Resigns

Henry F. Scheetz, Jr., has resigned as chairman of the board of directors of Brown Co. The duties of that position will be assumed by Leonard A. Pierce, president of the company. Mr. Scheetz will continue as a director.

Bower to Head Grays Harbor Hoquiam Plant

Ray F. Bower, former woodlands manager for Hammermill Paper Co., has been appointed resident manager of the Grays Harbor Paper Co., in Hoquiam, Wash. Mr. Bower has recently transferred to Hoquiam so as to become fully acquainted with the facilities under construction and will assume his duties when the project is completed in about one year.

S. M. Collier

Spaulding Advances Collier to New Post

James A. Foxgrover, president of Spaulding Pulp and Paper Co., Newberg, Ore., announces that the board of directors have elected Sidney M. Collier executive vice president and general manager.

A native of Tacoma, Wash., Mr. Collier is widely known in the West Coast pulp and paper industry. Since graduating from the College of Puget Sound, Tacoma, he has held a number of important positions in both United States and Canadian pulp and paper companies. In January 1957, he was appointed general manager of Spaulding, and in 1959 elected vice president and director.

Weyerhaeuser Creates Marketing Research Dept.

Weyerhaeuser Co. has created a marketing research department within its research division and appointed Leonard M. Guss, Columbus, Ohio, as manager.

Mr. Guss, employed by the Battelle Memorial Institute at Columbus for the past five years, will have headquarters in Philadelphia, Pa.

Petry Succeeds Kilp At Nekoosa Edwards

Robert A. Petry has been named manager of the woodlands department for Nekoosa-Edwards Paper Co. Assistant manager of the department since 1954, he succeeds F. George Kilp, who has been chief forester and woodlands manager since 1925. Mr. Kilp, who is eligible for retirement, will continue on active duty with the department in a staff capacity.

Plant Piping Problems?

Solve Them With

ARMCO WELDED STEEL PIPE

New steels are born at Armco

Simple or complex plant piping systems can be solved equally well with Armco Welded Steel Pipe. Special fittings, elbows, tees and wyes are made to your plans and supplied attached to straight runs of pipe. This economical pipe is ideal for white water, waste, stock, water supply and steam lines. Uniform wall thicknesses make Armco Pipe strong throughout, and the smooth interior means there is nothing to retard the flow of fluids.

Write for your copy of the catalog, "Armco Welded Steel Pipe for Industrial Uses." Armco Drainage & Metal Products, Inc., 6540 Curtis Street, Middletown, Ohio.

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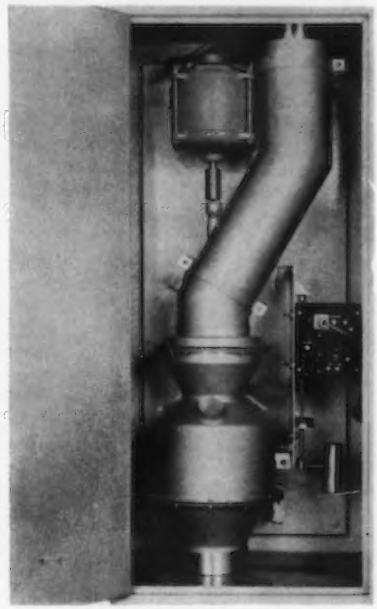
PJT NEW EQUIPMENT & SUPPLIES

Weighs & Records Dry-Flowing Materials

Industrial Processes, Inc., has developed and is marketing the "IPI" Dry-Flow Meter that weighs and



meters a wide range of dry flowing material without interrupting flow. Accuracy tests show variance confined to a maximum of one per cent plus or minus, it is reported. The meter is not intended to substitute for beam scales, but rather to provide continuous, instantaneous or recallable stream-flow data and a low-cost approach to complete automation of dry-flow bulk processes.

The "IPI" Dry-Flow Meter operates on an impact principle, translating unit weight of stream flow into electrical current via a new type of electronic transducer. Optional instruments (1) give direct readings in unit weight per unit time from local or remote stations. (2) make permanent recordings of flow for future study, or (3) totalize readings for any time period desired. Addition of a controller and volumetric feeder permits automated control of a dry-flowing material process.

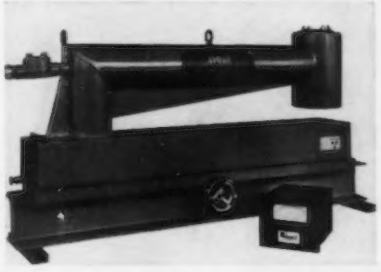
The "IPI" Dry-Flow Meter measures about 46 inches high, 22 inches wide, and 16 inches deep, and can usually be installed in existing dry-flow systems during a normal downtime period. It is available in various sizes to meet varying requirements. Detailed information can be obtained by writing the manufacturer: Industrial Processes, Inc., 621 S. W. Morrison Street, Portland 5, Ore.

Beta Ray Gauge has Transistorized Power Supply

A beta radiation nuclear gauge developed by The Ohmart Corp. is said to be the first to feature a miniaturized transistor power supply indicator which results in a simplified circuitry which, in turn, decreases space required and lessens maintenance.

Two different radiation sources are used in three different models. Krypton-85, with beta energy of 0.695 mev. and a half life of ten years, is the source for paper as thin as 0.002 inches. Repeatability is better than 40 p.p.m. Strontium-90, with energy of 2.18 mev. and a half life of 28 years is used for paper with minimum ranges of 0.050 inches.

The gauge employs the patented Ohmart conversion cell to produce electrical current from radiation for a continuous record of thickness variation and automatic control of the system. Mounted on a yoke type assembly, the measuring components, radiation source and Ohmart cell,



have either automatic or manual traverse across the measured material. Automatic traverse can be programmed to specific user requirements.

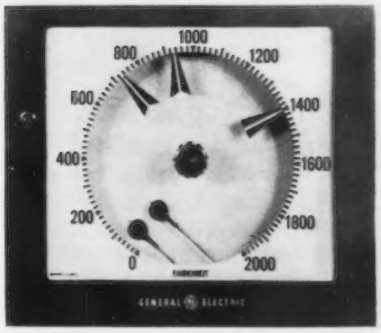
In the measuring assembly, a single vacuum tube transducer is mounted integrally with the cell in a constant temperature housing. It is connected to the miniaturized power supply indicator, housed in a gasketed case, which may be located up to 500 feet away.

Four calibration controls are provided. Electrical balance of the system is checked by simply grounding the input by a switch and setting zero control with a screwdriver adjustment. Other adjustments provide zero suppression, calibration span setting, and one to match recorder and meter readings.

Each radiation source has a four position shutter—open, closed, equivalent absorber number one and equivalent number two. Equivalent absorbers simplify manual standardization of the gauges. The four positions are indicated by red, green, and yellow lights. The shutter can be remotely operated with automatic shut-off in event of power failure. The Ohmart Corp., 2236 Bogen Street, Cincinnati 22, Ohio.

Two-Pen Round-Chart Recorder Available

A two-pen potentiometric round-chart recorder-controller, accurate to within plus-or-minus one-quarter



per cent, has been announced by General Electric Co., Schenectady 5, N. Y.

The recorder's two measurement circuits may be either potentiometric or bridge-type, or a combination of both. Zener diodes, offer a constant voltage reference accurate to plus-or-minus 0.05 per cent. Temperature coefficient is 0.001 per cent per degree C.

Minimum scale spans for the recorder are one millivolt d-c. Available response times are four, 10, and 24 seconds full scale. Concentric scale length is 27.5 inches. Pen speeds are four, 10, and 24 seconds full scale, and chart speeds are one, eight, 12 or 24 hours, or seven days.

A wide variety of accessories is available for the new recorder, including retransmitting slidewires,

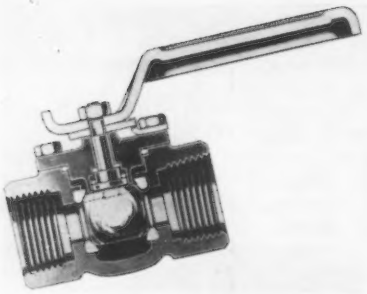


FIG. 700 Ball Valve being introduced by the Lunkenheimer Co. of Cincinnati, Ohio, is being introduced in bronze body, screw ends, pipe sizes 1/4-2 inches, with Teflon or Buna-N seats and seals. Top entry through a removable cover provides for in-line maintenance. This exposes the ball, which is removed by the "hook" on the valve's specially designed handle. The self-aligning ball rides on its seats, sealing at high or low pressure without springs or bearings. The company is readying a stainless steel line, with carbon steel to follow. Lunkenheimer Co., Cinn., Ohio.

integrators, and marker pens. Adaptable for either surface or semi-flush mounting, the model is 19 inches wide, 16-3/16 inches long, and 15-7/8 inches deep.

Borated Dextrin Adhesives Cold-Water Soluble

A series of cold-water-soluble borated dextrins developed by the A. E. Staley Manufacturing Co. and marketed under the brand name "Koldex," are designed to produce light colored liquid adhesives in the 1,000 to 1,500 centipoise viscosity range measured at 80°F. with solids concentrations of 20, 30 and 40 per cent.

The same stable viscosity may be obtained at other solids levels between 20 and 40 per cent by using the dextrins in combination, or other viscosities may be obtained by adjusting the solids. The Koldex dextrins says Staley, provide the added convenience of cold water solubility, the handling ease and economy of a dry product with the performance and dependability of a prepared liquid adhesive.

Koldex dextrins are packed in 50-pound, polyethylene-lined, multiwall paper bags, ready for use "as is" by merely adding to water and agitating an hour before application. Further information and technical data are available from A. E. Staley Mfg. Co., Decatur, Ill.

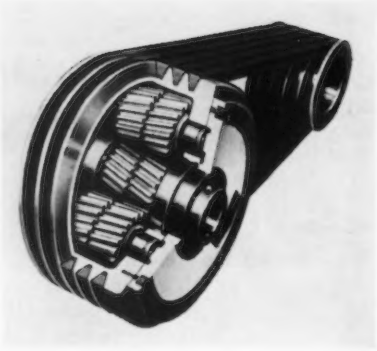
Rotating Transmission With High Torque Capacity

A shaft-mounted rotating transmission, providing a combination of control flexibility, high torque capacity, progressive overload capacity, compact size and other features, has been introduced by Airborne Accessories Corp.

Called Roto-mission, the transmission is one-third smaller than other units, affords reduction ratios of up to 270 to 1 exclusive of additional reduction through pulley drive from the drive motor, and affords a wide range of control options for many applications.

Concentrically mounted on a machine's driven shaft, the transmission operates the machine at a reduced speed from that of the drive motor. The entire transmission is contained completely within the outer surface, which is machined for V-belt drive from the motor. The units are available in capacities from fractional through 60 h.p., for torque ratings through 21,850 pound-feet in standard models. Special units also can be supplied for extremely high torque capacities.

The basic Roto-mission is a differential planetary gear transmission which provides high torque capacities with a wide range of reduction ratios. Roto-mission's ability to use as many as 12 pinion assemblies is due to a nylon splining process. During construction, all gears are located precisely in a dummy transmission so that pinions intimately engage sun gears of the correct size and type. Nylon then is injected under pressure through the hollow pinion shafts and into splined voids between pinions and shafts.



Various methods of installation, control and restraint can be used with Roto-mission transmissions. Control set-ups include friction clutching to provide overload slipping or to provide fingertip control for a machine operator, electromagnetic clutch operation for remote control, and torque limiting and release through the use of mechanical, electrical, or hydraulic means.

Two-speed operation can be obtained. Manual or electric clutches can provide an output of either the normal reduction speed or direct drive without any reduction. An auxiliary motor with clutch control can be used to permit selection, for instance, of the main motor for high-power high-speed drive, or a small motor for low-speed low-power drive. Further information may be obtained from Airborne Accessories Corp., Industrial Division, 1414 Chestnut Ave., Hillside 5, N. J.

Limit Switch Magnet Operated

A magnet operated limit switch, designed for operation without physical contact of levers, rods or shafts, is available from General Electric's General Purpose Control Dept., Schenectady 5, N. Y.

The switch is available with one normally open contact.

The permanent magnets may be installed on any portion of the equipment (movable or stationary) to be controlled. In addition, both magnet and switch can be fixed and the switch operated by passing a vane of magnetic material between the two. The magnets are available in two forms, the CR115 x 1, 5/8 inches diameter and 2½ inches long; and the CR115 x 2, 1 and 1/8 inches in diameter and 7 inches long.

Designated the CR115A19, the magnet operated limit switch is available with contact ratings of 0.75 amperes make, 0.2 ampere carry and break at 115 volts AC. Response time is 0.001 second. When used with d.c.,

Modern Methods of Mechanical Pulp Manufacture

This book comprehensively covers all aspects of groundwood pulp production. The author, K. H. Klemm, has a broad knowledge of groundwood manufacturing methods and has been associated with groundwood mills on both sides of the Atlantic. Price: $5.00.

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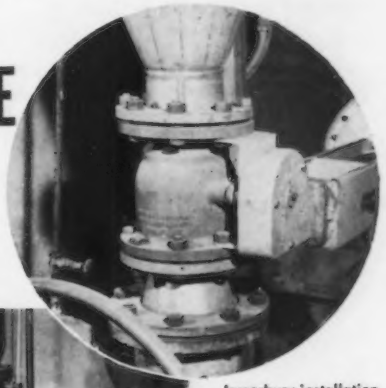

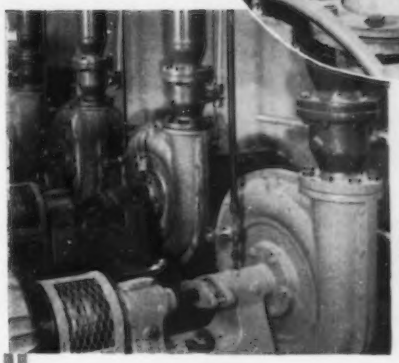

Jamesbury installation at Weyerhaeuser Longview Plant

Jamesbury installation at Mead Corporation Chillicothe Plant

As varied as the valving requirements are in pulp and paper processing, the Jamesbury "Double-Seal" Ball Valve is meeting them successfully. Jamesbury offers a functional, efficient, economical Ball Valve which has proved itself in performance in many major installations such as the examples shown above.

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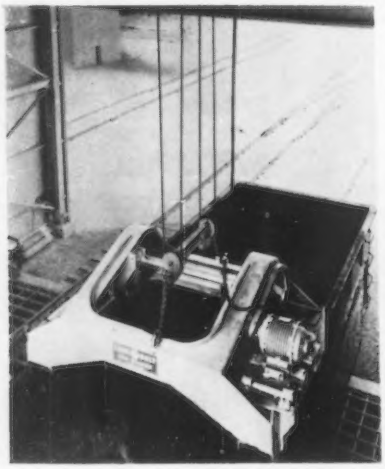
the switch requires arc suppression which varies with the circuit parameters. The switch may be used to operate static control relays, four-pole relays, and similar devices. The switch is available with one normally open contact. Its applications include skip hoists, overhead conveyors, and similar installations.

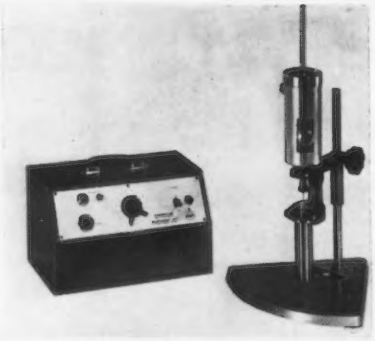
Shaker Unloads Hopper Bottom Chip Cars

One-man-operated railroad car shaker incorporates a low-frequency vibration shaker mechanism design



for fast, economical unloading of hopper bottom cars carrying wood chips, coal, and other bulk materials. From 8 to 10 cars may be unloaded per hour.

The shaker mechanism transmits low-frequency vibrations to the top of car sides, parallel to the horizontal axis of the car and in the direction of maximum strength, with no undesirable sidewise movement. Lengthwise shaking action is produced by two unbalanced weights mounted on a shaft which turns on two spherical roller bearings through a 20 h.p. motor.



EPPRECHT VISCOMETER is capable of 15 readings that can be used to produce rheograms and automatically control manufacturing processes, when flow characteristics are a function of product quality. Speed varies from 5.6 r.p.m. to 352 r.p.m. with shear rates from 1 to 2000 seconds and shearing force from 2 to 200,000 dynes per square cm. It measures viscosity in the range from 0.2 cp. to 10,000,000 cps. Electrical requirements are 110 volts, 60 cycle a.c. J. W. Fecker, Division of American Optical Co., 6592 Hamilton Ave., Pittsburgh 6, Pa.

The car shaker can be mounted anywhere along the length of the car, in single or multiple railroad track arrangements, with fixed or traveling hoists or cranes.

Features of the car shaker include: rigid steel frame, reinforced mounting shoes for maximum contact area, shaker mechanism that withstands stresses and impacts, efficient Poly V-belt drive for low-slip power transmission, floating motor mounted on rubber bushings, low noise level, and level-lifting attachment for car-shaker positioning. Further information is available from Link-Belt Co., Dept PR, Prudential Plaza, Chicago 1, Ill.

Raschig Rings of Fluorocarbon Resin

The availability of Fluoroflex-T (Teflon) Raschig Rings has recently been announced by Resistoflex Corp., Roseland, N. J.

These chemically inert tower packings are said to provide maximum product purity and maintain more uniform flow rates in mass transfer for longer periods than conventional materials. Made of non-porous, high density TFE fluorocarbon resin, they resist tendencies of sludges, sus-

pended or precipitated solids and contamination products to build up and restrict flow. They are said to be particularly suited for HF and other acid processes at temperatures to 500°F.

The thin wall design of Fluoroflex-T Raschig Rings combines optimum stiffness with light weight for maximum economy. Standard Rachig Rings are available in ⅝, ¾, 1 and 1¼ inches nominal O.D. Other sizes are available on request.

(Continued on page 34)

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Famous Burro Trail Down Into Grand Canyon

*Idea submitted by R. D. Jacobs, 3006 Burge Ave., Hopewell, Va.

Photo by: H. Armstrong Roberts

HAM FELTZ says:

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"To increase their enjoyment of the awesome spectacle of the Grand Canyon, many visitors take this trail to the Canyon floor.

"Reminds me that papermakers who order Hamilton Felts take the *right* trail to increased profits."

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"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every U.S. papermaker entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

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FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

One in a series of interviews with the men who are "Virginia"

"We offer free mill trials to show the fine results and low cost of groundwood pulp one-stage hydro bleaching—the only cost to the mill is for the hydro"

George V. Rittenhouse (left) and Robert W. Barton

Technical Service Supervisor Bob Barton and District Manager George Rittenhouse, both of Virginia Smelting Company, answer questions about bleaching groundwood pulp with one stage of hydro.

Q Do zinc and sodium hydrosulfites provide the most economical method of one-stage pulp bleaching?

Mr. Barton—If the mill is going for anything between 2 and 11 brightness points, bleaching groundwood pulp with hydro is virtually always the cheapest method. It is easier to apply—there are no control tests involved—and the chemical cost is much lower.

Q Is it difficult to set up a trial run for a mill that might want it?

Mr. Barton—Not usually. Frequently much of the equipment we need is available in the mill. We go in with our lab equipment and make tests, checking the *p*H we're going to deal with, and possibly deciding on the maximum temperature possible. We give all the facts to the mill—and if they want the trial, we set it up. Often the mill has a pulp storage chest. A few changes and we can use it as a bleaching tank. We'll bring in feeders, attach hoses, and start the trial.

Mr. Rittenhouse—Our technical men stay there until the setup is running perfectly and they make sure the operators know everything they need to. You'd be surprised at what we run into sometimes, even in mills that have been bleaching regularly with hydro. They take the powdered hydro and dump it in on top of the stock. Of course, hydro breaks down fast when it is exposed to air, and they wind up with reaction times too short—temperature not showing the proper effect—and poor brightness response at the end. I might add that faulty mixing like this can cause a corrosion problem, too—a problem that does not arise if proper air-free mixing is standard procedure.

Mr. Barton—A good point, George. This is the chief reason why some mills are under the mistaken impression that hydro always causes a corrosion problem. If hydro is handled properly there's no corrosion problem.

Q Isn't a mill trial a pretty extensive service at no charge?

Mr. Rittenhouse—Yes, I suppose so—but I consider it the most effective way of showing a mill the economy and the good results obtainable with hydro. After all, mill trial data offer the most believable evidence of what I say. And production doesn't have to be stopped—we can almost always set up the mill trial without affecting it.

Q What are the advantages to the mill in using a "Virginia" hydro?

Mr. Barton—There are several. One is the consistently uniform quality and purity of our hydro, either the zinc or sodium. It's a very clean, free-flowing powder—made, packed and shipped as moisture-free as modern manufacturing methods can make it.

Mr. Rittenhouse—And of course our technical service goes with it. A mill can always call for assistance and get a "Virginia" technical man. It's the accepted thing with our customers.

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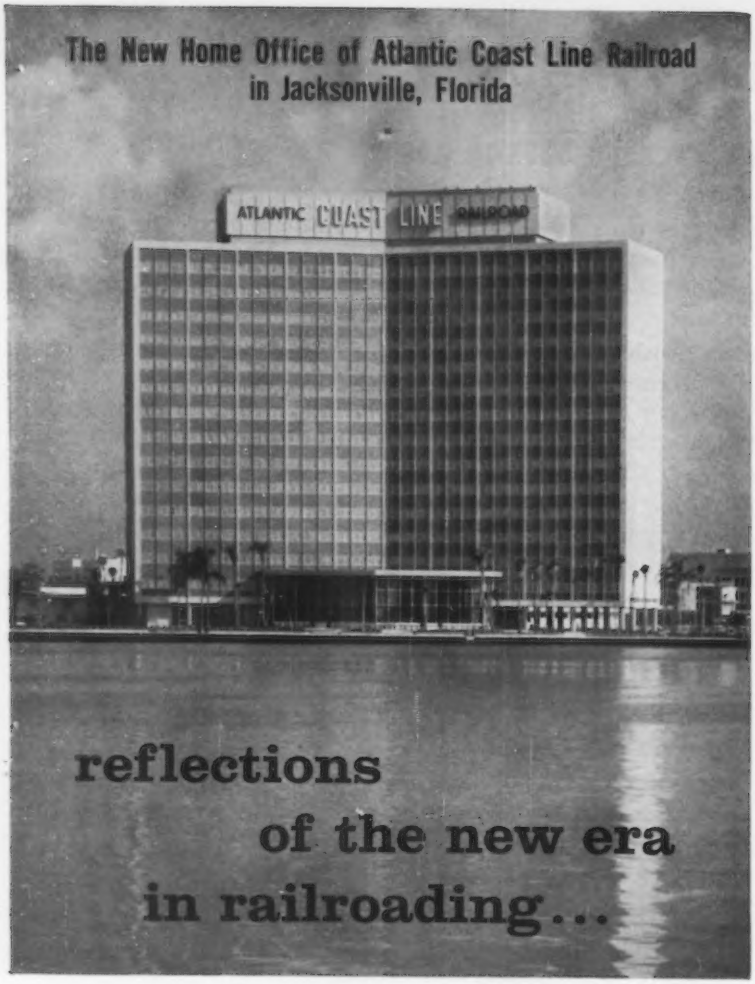

There's a new reflection in the St. Johns River in the heart of busy Jacksonville. Mirrored in the rippling river and rising 17 gleaming stories into the sky above is the new general headquarters of the Atlantic Coast Line Railroad.

This new building in a new home town marks a significant step forward for the Coast Line. We believe it also stands as an apt symbol of the refreshing transition now at work throughout our industry... one which promises unparalleled expansion and modernization of rail services and facilities.

Coast Line's new home at the center of our operations in the growing South is tangible evidence of our faith in this new era of more and better services for our customers.

...serving the Southeast Coastal 6

ATLANTIC COAST LINE RAILROAD

NEW EQUIPMENT & SUPPLIES

(Continued from page 30)

Fuel Oil Additives Eliminate Combustion, Sludge Problems

Two additives designed to eliminate major problems in the use of residual fuel oils in industrial and utility boilers have been developed by Dearborn Chemical Co., Chicago, Ill. A third product that improves fuel combustion in coal-fired boilers also has been announced.

Each of these products is formulated for a specific purpose in order to provide increased efficiency, reduced maintenance and extended life of equipment, according to Dearborn officials.

Dearsol 30 is a combination sludge dispersant and combustion catalyst that prevents clogging of strainers, burner tips, filters, oil lines and oil preheaters. By eliminating sludge build-up, fuel tank capacity is maintained at maximum. A stable liquid product readily soluble in all residual fuel oils, Dearsol 30 improves combustion, thus eliminating excessive smoke and heat-wasting soot deposits.

Dearsol 35 is a liquid organic catalyst that insures complete combustion of fuel. Readily soluble in residual fuel oils at all use concentrations, this product is said to release the maximum number of BTU's in every gallon of oil and eliminates soot and carbonaceous deposits. Where sludge problems are not significant, Dearsol 35 may be the only fuel additive that is necessary.

Both of these products are used undiluted as received at a normal dosage of one quart per 1000 gallons of fuel oil. Easily fed into any system, they are added to the fill or sounding line just before delivery of fuel.

Fireside Treatment No. 1 is combustion catalyst for use in coal fired boilers to improve fuel combustion, minimizes slag build-up and insures maximum steam production efficiency.

A light gray, free flowing powder it can be fed intermittently by hand directly on the fire bed or may be added to the coal skip before dumping into the coal hopper. It also can be fed by a steam injector to prevent slag on grates as well as on tubes and walls. For additional information on any of these products, write to: Dearborn Chemical Co., Department WT, Merchandise Mart Plaza, Chicago 54, Ill.

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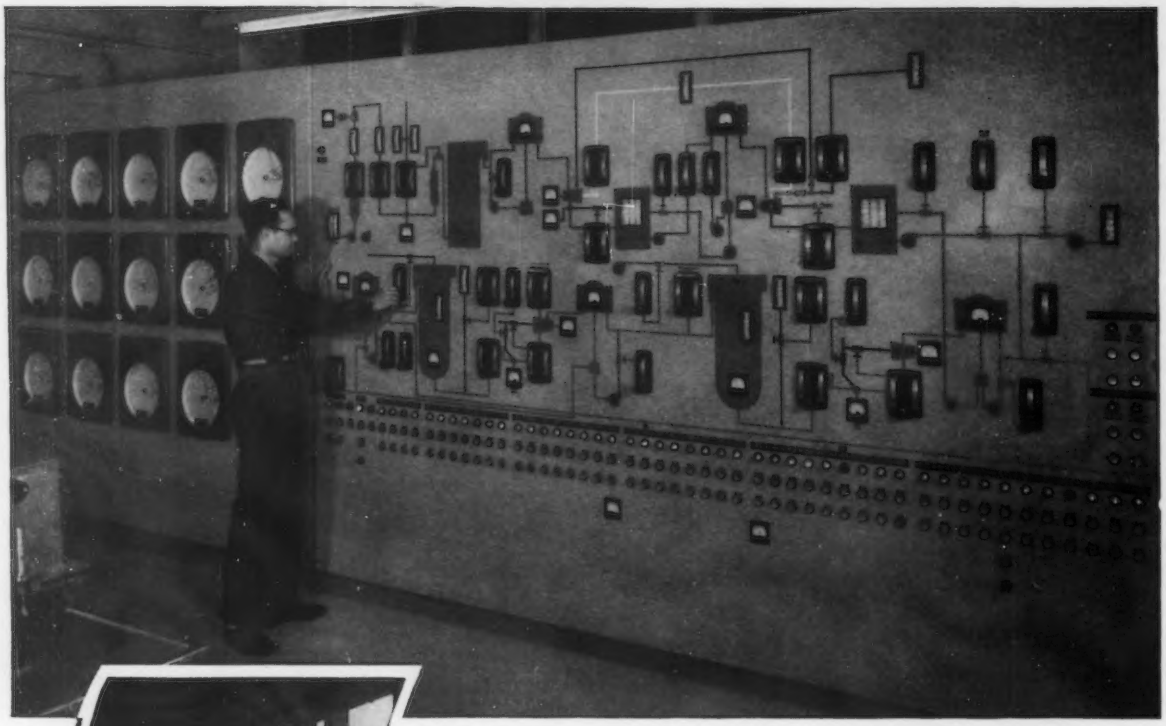

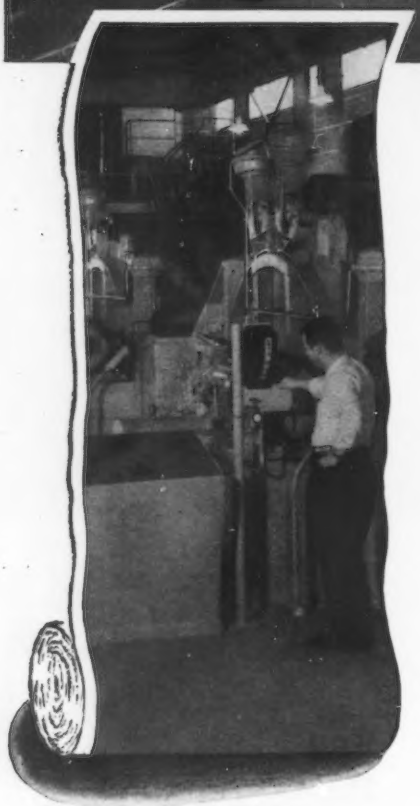

Photos courtesy Marathon Southern Corporation

Bailey controls Marathon's five-stage bleach plant!

Marathon Southern's five-stage bleach plant at Naheola, Ala., is one of the most completely instrumented in southern U.S.A.

Rigid quality control—automatic and foolproof—keeps production going at top speed with unvarying excellence in the finished product.

The panel board in the central control room (above) was built and instrumented by Bailey. Note how it is divided into two sections. The 15 Bailey Recorders in the recorder section provide continuous circular chart records. The functional graphic panel on its right provides a complete visual picture of the entire process. Important control variables such as stock consistency, stock flow, bleach liquor flows, stock temperatures, etc., can be watched and instantly corrected, either automatically or manually.

At the same station, the operator can supply consistency-controlled stock (from any of four storage towers) to any of the semi-bleach, pine bleach, or gum bleach pulp chests on a ratioed flow, automatically controlled basis.

Each of the five vat bleach washers is equipped with automatic level control (as shown at left).

This is but one example of how Bailey is helping pulp and paper processors to greater degrees of automation, efficiency, and quality control. Let your Bailey Engineer suggest applications to fit your operation. Or write for specific control systems information for your entire plant operation.

P149-1

PULP AND PAPER DIVISION

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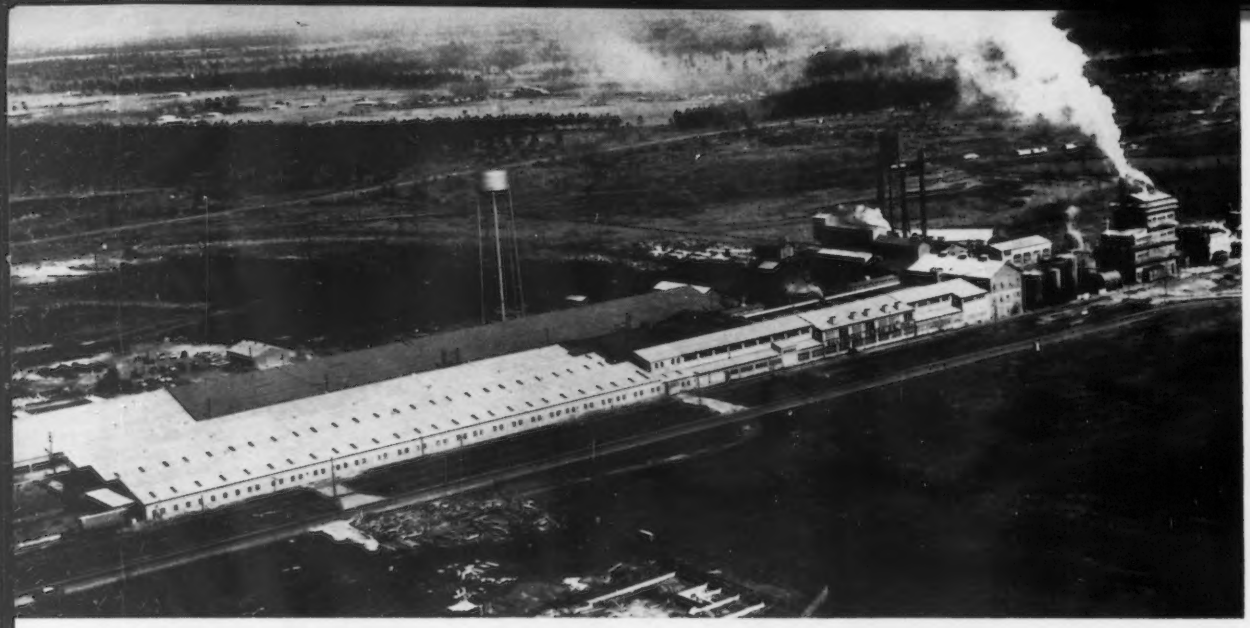


35 Major Projects, $10½ million since 1950 . . .

Calcasieu's "Do-It-Yourself" Approach to a Decade of Growth

By utilizing its own staff to the fullest, this Louisiana mill estimates it has saved 25 per cent in capital expenditures. Here is what they have done . . .

Ernest F. Barker,
European Editor,
Paper Trade Journal

Calcasieu Paper Co., of Elizabeth, La., a subsidiary of the Jacksonville Paper Co. of Florida, is engaged in a gradual but continuous major modernization and improvement program which has so far meant a total investment of over ten and a half million dollars, including planned improvements this year. A number of unusual background factors of this program are interesting, not the least of which is the spirit of the people at this mill: how an atmosphere of let's-see-how-well-and-how-economically-we-can-do-it-ourselves permeates throughout the entire organization.

The mill's modernization program has been an almost perpetual one. During the decade just passed, 35 separate improvement projects have been completed or are currently in the process of being completed. The program started in 1950 and the end is not nearly in sight, because new growth and improvement projects continue to crop up. And underlying all of them there is the determination of doing as much as possible without outside help, from financing through engineering to doing of the work in the mill's own maintenance department.

R. T. Hudson
Vice President and General Manager

Calcasieu Paper Co. and the town of Elizabeth on the outskirts of which the mill is located, date back to 1906 when the Industrial Lumber Co. founded both, as a completely integrated saw-mill facility and community. The paper mill was erected later in 1925 to manufacture paper from southern pine stump material, but this scheme soon proved impractical. As a result the operation was changed to the standard kraft process a year or so later. The saw mill operation was discontinued in 1940 and in 1946 the paper mill and the town of Elizabeth were acquired by the Jacksonville Paper Co., a large paper merchant firm which operates a chain of warehouses and sales facilities throughout the Southeast. When the Florida organization took over the Elizabeth property, the mill was extremely rundown, outmoded

One of Mr. Barker's last assignments before departing for Europe last spring was to visit several mills in this country.

and badly in need of expert maintenance, repair and general rejuvenation. The new management immediately embarked on a program of modernization which included the erection of a new kraft pulp mill and the addition of a second paper machine completed in 1950. But all this was only a start, for sales efforts and general mill conditions soon showed that the improvement program of 1950 was still insufficient in keeping with modern mill practices. And that's when Calcasieu started the second phase of its current growth program.

Woodyard Modernization

Much was needed to convert the mill's original wood storage and handling facilities into a modern and efficient facility. Calcasieu utilizes southern pine exclusively, purchased mostly from independent woodlands operators. One third of the mill's wood supply is received by truck from the area which immediately surrounds the mill. The remaining logs come in by rail, mostly from east Texas. Until quite recently, a large area in the rear of the mill was boggy and entirely unsuited for wood storage. This area was land-filled, making its utilization as a woodyard possible. The installation of a conventionally-designed but modern flume followed in 1958. Constantly recirculating water carries the logs from the wood storage area to the wood room. Of interest is a unique suction sweep system which removes resulting grit and bark from a grit chamber at the end of the flume. The collected mass is then used as a landfill material. A 400-gallon pump handles recirculation and flume-system make-up water does not exceed 30 per cent. The flume is 727 feet long, six feet wide at the top and it tapers to a rounded bottom. Water used in the flume comes from the evaporators and an automatic water pH control system is part of the flume installation to assist in preventing corrosion of the flume itself and auxiliary equipment.

Kraft Pulp Mill

Because it was rebuilt and completely modernized almost from the ground up in 1950, Calcasieu's kraft pulp mill will remain essentially unchanged in the immediate future, according to mill spokesmen, who point out that the greatest majority of the old pulp mill equipment was retired 10 years ago. For this reason, the pulp mill will see only minor changes during the current phase of Calcasieu's modernization program. Plans call for construction of a new tall oil plant and a new saltcake silo in 1960. The silo itself has already been received at the mill but its necessary blowing equipment has yet to be designed. A third kraft mill improvement project has now been completed: the installation of a new lime kiln, completed about a year and a half ago and in operation since that time. The pulp mill supplies the paper mill with practically all of the company's pulp needs with the exception of about 3,500 tons of bleached pulp which is purchased annually. The Calcasieu pulp mill is equipped with six digesters and can continue to adequately supply the paper mill including an anticipated increase in paper mill output capacity to be realized later this year as the result of a planned No. 1 paper machine modernization program.

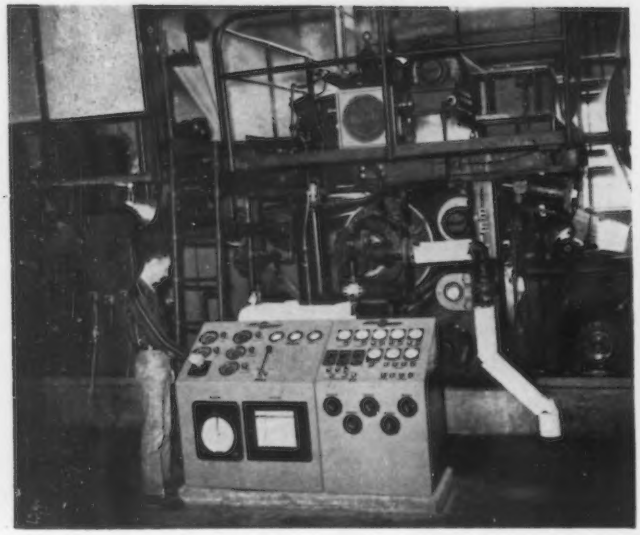
Three Paper Machines

Calcasieu's real growth is perhaps best demonstrated by the way it added two paper machines in less than a full decade and the way the greatest majority of the erection work was performed by the mill's own maintenance force. No. 1 machine (due for modernization this year as described below) is a 1925 vintage Beloit 96 inch trim machine, rated presently at a top speed of 800 f.p.m. No. 2 machine, installed in 1950, is a 162 inch Pusey and Jones unit which operates at a 1,500 f.p.m.

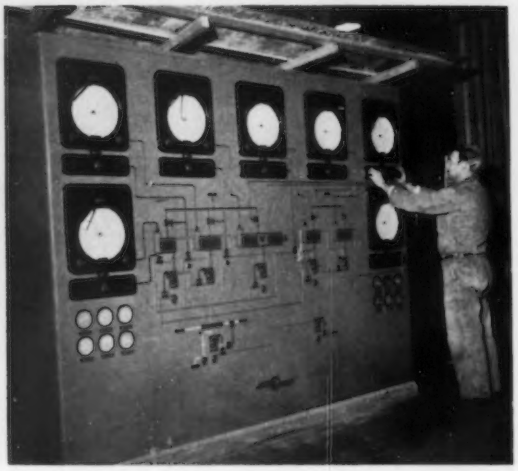
No. 3 machine, installed in the summer of 1957, was purchased from a mill in Massachusetts and completely reconditioned before erection by Calcasieu's own staff. This is a 96-inch trim machine, also Pusey and Jones, operated at 900 f.p.m. A considerable amount of "do-it-yourself" fabrication, including the manufac-

Log conveying flume (from wood storage to wood room) is 727 feet long.

A unique suction sweep system removes bark and grit from the grit chamber at end of log conveying flume.



Beloit extensible press installed on No. 2 machine for the production of Clupak stretchable papers.



New condensate control panel on No. 2 paper machine.

ture of a reel and the installation of a self-made hood was accomplished. During our tour of the mill, No. 3 was down for a headbox change. The headbox was redesigned and built from the original by Calcasieu personnel and includes new type baffles calculated to improve formation of the sheet. The new headbox was installed in 40 hours.

The expansion program of 1950 increased the mill's production from 40 tons per day to 175 tons with the addition of No. 2 and this was followed in 1957 by an additional production increase to 210 tons with the installation of No. 3 machine. This production was in turn increased in 1959 to 225 tons average by modernization of the mill's finishing department which made longer machine runs possible.

These three machines now produce an average of 210 tons and a maximum of 250 tons per day of various kraft grades, including wrapping, bag and sack, waxing, asphalting, multi-wall, foil laminating, waterfinish, gumming, extensible and various other kraft specialties.

The modernization of No. 1 machine heads the list of some of the major projects scheduled for this year. The improvements made on this machine alone are expected to result in a production increase of approximately 10 per cent for this machine. The project includes the addition of a second calender stack, two additional dryers, and the installation of a new reel, the latter again entirely of the mill's own manufacture and fabrication. In addition, an Industrial Nucleonics Accu-Ray basis weight measuring device is to be installed. Considerable work on the machine room including an entirely new roof structure is planned. The installation of a new (also self-made) Fiberglas hood is also part of this project.

Bag Plant Grows

Also located at the Elizabeth mill site is the Bag Manufacturing Division of Southern Maid Paper Co., an affiliated company under the same executive management as the pulp and paper mill. This plant now employs about 300 men and women and manufactures a wide line of single wall and duplex kraft bags and sacks. When the parent company acquired the Calcasieu paper and pulp mill properties in 1946, the bag plant was moved from Jacksonville, Fla., to Elizabeth.

Here too is progress and growth: a bag plant main building expansion is just now being completed in conjunction with the mill's warehouse building enlargement. The bag plant building is being extended by some 160 feet to create a building 120 feet wide and 724 feet long. Some new bag making and allied machines are also being currently installed.

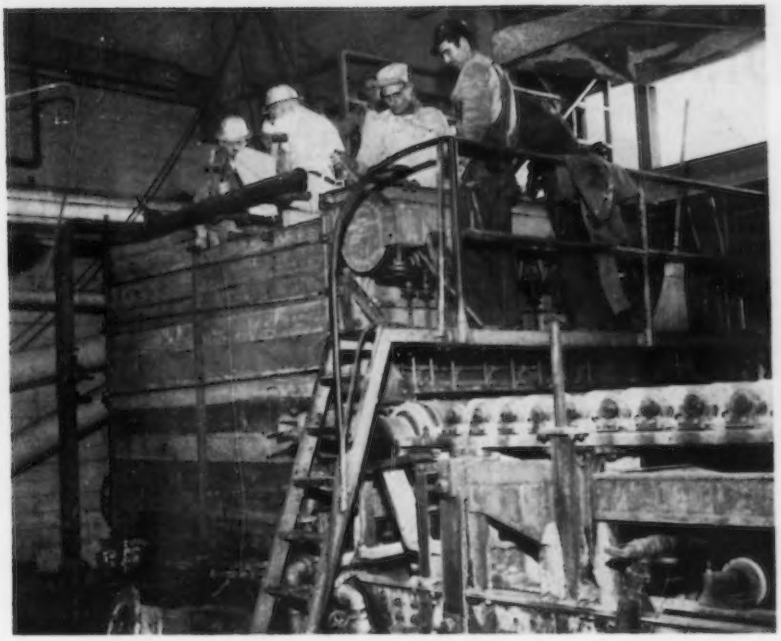
Sound Program

Calcasieu's prime uniqueness lies in the way it handles its growth program, sparked to a great measure by affable R. T. ("Russ") Hudson, vice-president and general manager. General superintendent is a seasoned papermaker, Walter L. Vignes.

Calcasieu's efficient engineering department is headed by W. E. ("Buster") Emigh, chief engineer, and C. C. ("Bill") Martin, is assistant plant engineer, who also escorted the author around the mill.

Calcasieu's maintenance staff makes up a department considerably larger than those usually found in modern mills of medium size and output. By utilizing its maintenance force to the fullest and by attempting to handle the greatest majority of all improvement projects internally, Calcasieu estimates it realizes savings up to 25 per cent for both capital expenditure and maintenance jobs compared with what it would have to spend if it were to contract such work to outside organizations.

The company lists the following factors as most essential in making its "do-it-yourself" concept successful: (1) Management's basic desire to do so in the first place; (2) well-trained, skilled crews, especially a capable fabrication crew; and (3) the employee's desire to want to do it, i.e., high morale, constantly fostered and developed further by the company through an effective employee relations program. Essentially this means pointing out (repeatedly so) that construction and major maintenance projects help immeasurably in staving off layoffs during slack production periods. This in turn does much toward instilling a strong measure of pride in all em-



New headbox for No. 3 machine was installed in 40 hours time by Calcasieu's own maintenance crews.

ployees in "their" mill's ability to handle so many major mechanical projects without outside assistance.

Calcasieu Paper Co. has come a long way since it started its gradual modernization program, a program that has gathered momentum steadily during the past decade and a half. Tangible results can be seen everywhere as a result, made doubly encouraging in view of the fact that most of these funds have been generated from profits on a pay-as-you-go basis. Much needs yet to be done however to realize the basic objective which underlies these efforts: to transform a small, antiquated mill into the modern, efficient organization. But Calcasieu presents a contrast of the old vs. the new . . . with the new replacing the old at a rapidly increasing rate.

New Clupak Unit

The mill has recently invested half a million dollars for the installation of a Beloit extensible press on No. 2 machine for the manufacture of Clupak papers. This unit was installed around Christmas of 1959 during a two-week shutdown when an entirely new Beloit steam condensate system was installed. The new Clupak unit was installed between the machine's second and third dryer sections. It represents an equivalent length of three paper machine dryers and to make room for it the third dryer section, the stack and the reel were moved. Although the extensible press is not yet in full production all personnel training activity and most test runs have been completed. Calcasieu will use the press to produce 35 to 120 pound basis weight papers in a number of grades.

Other New Buildings

The expansion of the mill's finishing, warehousing and shipping facilities is an important part of the current expansion program. By enlarging the finishing room space and by permitting more adequate utilization of the finishing room equipment the mill's overall production has been raised by about 15 tons per day because it is now possible to achieve longer runs on the paper machines. Formerly it was sometimes necessary to go off certain runs on the paper machine because the finishing room was unable to keep up. A new Seybold cutter is the only actually new finishing room equipment thus far. More is planned.

The mill's new shipping and warehousing building, also erected entirely by mill personnel, will be 203 feet wide by 504 feet long, a substantial increase over the old facilities. The two departments are housed in a peaked-roof, single-story structure. The expanded department provides enough space to accommodate 16 railway cars at one time. Of particular importance is the fact that the adjacent bag plant (Southern Maid Paper Co.) and mill warehouse now have combined loading facilities which permit mixed car loading, a very distinct and obvious advantage in facilitating more economical shipments from both plants in many cases.

A new mill operations office was erected a year ago, partly because additional office space was required and partly because the site occupied by the old mill office building needed to be vacated to make room for the warehouse extension. All construction work was handled by Calcasieu erection crews. Earlier, Calcasieu also built a separate personnel department office structure, completed at relatively low cost. Also completed about this time was the new mill operations office, which also houses the mill's up-to-date central laboratory.

Yet to come in the line of new office facilities is a new general office building. This will be a 174 feet by 78 feet, single story structure, also to go up without outside contractor's help. Work on this project has just started.

New Power Plant

Using natural gas almost exclusively, the present power plant was erected at a sizable expenditure as a part of the mill's 1950 modernization and is located on the site of the original saw mill, approximately one quarter of a mile from the present mill. This facility has now become inadequate. Accordingly, Calcasieu intends to make an additional investment of perhaps twice the cost of its present power plant facilities.

The company is now in the process of purchasing such equipment from the Virginia Public Service Co., a public utility company in Hampton, Va. The new equipment will consist of a 1,000-lb. pressure B&W boiler with 200,000 pounds per hour steam generating capacity and a 6,000 kw. Allis Chalmers generator. This equipment will form the nucleus of what will eventually be an entirely new power plant for Calcasieu and will be installed close to the mill in a power plant facility entirely separated from the existing plant. However, the mill will continue to draw on its present facilities even after the new equipment has been placed into operation late this year. Engineering work for the new plant is well along and construction and installation work is scheduled for completion by June 1, 1961.

Loading and Unloading Pulpwood—

A Material Handling Concept

Mechanized pulpwood concentration yards for both barge and rail rack cars move more wood at lower cost for I.P.Co.

Thomas N. Busch,
Chief of Woodlands Operations,
International Paper Co.,
Mobile, Ala.

Soon after World War II, International Paper Co. began to regard the job of harvesting pulpwood as primarily a material handling job. Every step, including felling, limbing, skidding, bucking, loading, hauling, reloading, and unloading involves material handling. Much of this requires hard physical labor, a costly and mainly involuntary process.

We introduced material handling methods at our pulpwood barge landings. As a result, we are now able to load and haul five times as much wood from less than one-half the original number of loading points. For example, our company built several fully mechanized barge landings in North Carolina, and established a form of 'super market' for pulpwood. We eliminated several small barge landings where wood was hand loaded each time we constructed a mechanized barge landing. This was made possible by the development of cable slings in a form that made practical the mechanical placement of wood on barges. A fleet of tugs and barges moved 54,000 cords of pulpwood in 1946, from 18 barge landings where wood was handloaded. It took one to two weeks to hand load a 230-cord capacity barge due to limited dock facilities and the congestion caused by several trucks. Time consumed per truck load was approximately 1.5 hours. By the use of rapid mechanical unloading devices, we are able to unload individual trucks in five minutes, or less, and better utilize our dock space as well as floating equipment. We now load a barge in four hours, or less, with a three-man crew. The original fleet of 150- and 230-cord capacity barges has been replaced with a lesser number of 400-cord capacity barges, and small tugs have been replaced with fewer and larger tugs. Our present fleet hauled 262,000 cords in 1959, from seven mechanized barge landings.

A greater contribution in manpower saving could be made on railroad shipments since 75 per cent of our wood was shipped by rail. As a trial, we built a mechanized pulpwood loading yard on a rail head about 60 miles from our Mobile, Ala., paper mill. Today, almost ten years later, practically all of our rail delivered pulpwood, amounting to 3,300,000 cords in 1959, is purchased and mechanically loaded through 218 mechanized rail yards. Normally, we would have had to obtain the same amount of wood through 6,600 railway stations, based on typical volumes formerly received from hand-loaded way stations.

Selecting an Area

There are certain basic factors which must be considered in the selection of a mechanized woodyard location to justify the capital expenditures necessary:

1. Adequate forested area within a 20-mile radius to sustain an annual cut of 20,000 cords or more in addition to the normal requirements of other forest products industries in the area.

2. If the location is in a town, it is necessary to determine whether the yard would be objectionable from the standpoint of general traffic, proximity to schools, hospitals, residential areas, or other factors which concern the local people.

3. Adequate network of roads and highways leading to the yard.

4. One-line rail haul, if possible, and the freight rate should be substantially lower than the general average being paid.

5. The railroad should have a sufficient number of open rack cars to assure a steady supply to the yard.

From the engineering standpoint, the area should be of adequate size: at least 75 yards in width and preferably long enough to build 750 to 1000 feet of railroad spur. This size is optimum as it provides sufficient space to store an inventory of wood in the yard in order to continue receiving wood even though there is a temporary shortage of rail cars. The rail yard should be well drained, with a minimum of cut and fill yardage. An all weather surface, or the type used to surface roads in the vicinity of the yard, should be applied. For example, this may be oyster shells in the coastal areas, crushed rock or a mixture of clay and gravel in other areas. But, the surface must be able to stand the heavy, concentrated loads imposed by traffic and loading equipment.

There is a wide selection of satisfactory loading equipment, including cranes, derricks, and fork lift trucks. Cranes should have a minimum capacity of 16,000 lbs. at a 15-foot radius, without outriggers. They should be on a rubber-tired,

By introducing material handling methods, we can load and haul by barge five times as much wood from less than one-half the number of loading points.

Excerpts from a paper presented at Fifth World Forestry Congress, Seattle, Wash., Sept. 10, 1960.

mounted carrier for rapid maneuverability. Fork lift trucks should have the same capacity. All equipment should have special four-legged bridle slings. Manufacturers of some of this equipment have special attachments for this purpose.

A unique, reusable, perforated steel strap and buckle combination was designed to confine stored wood in packages containing 1.5 cords to 3 cords to simplify rehandling. These are available from the principal steel strapping concerns. With care, these straps and buckles will last for dozens of applications.

Regardless of the type of material handling equipment available, several methods of application are recommended:

Cable slings are preferable to grapples in unloading trucks or trailers either directly to mill conveyors or to storage piles. The same size of crane, outfitted with slings, can lift larger payloads with less damage to transport equipment.

Special, positively controlled drags are ideal for unloading rail cars and barges direct to conveyors or flumes, but they cannot be used to place wood in storage piles. Where applicable, they have a high unloading rate with minimum damage to hauling equipment.

Grapples are used to unload transport equipment where it is impossible to apply cable slings to the loads. Their use is ideal in recovering wood from storage piles.

Pulpwood is delivered to a mechanized yard or mill in any amount and by any means of conveyance. It is then unloaded mechanically in a matter of minutes. Because wood is inspected and segregated as delivered, the quality of the wood has improved with resultant benefit to the receiving paper mill, and its wood handling costs have been reduced.

Lower Freight Costs

These yards are located in favorable freight areas. If we had continued to receive pulpwood in the same amounts as in 1950 from the former 6000 shipping points, our freight costs would have increased 25 per cent by 1959. However, actual freight costs in 1959, resulting from purchasing 93 per cent of the rail pulpwood at 218 strategically located mechanized rail yards, decreased 24 per cent below 1950 freight costs, for a total saving of 49 per cent.

This lower cost is significant when you consider that rail freight cost in the South, as a whole, amounted to more than $50,000,000 in 1959. Consider, also, that railroad car demurrage costs and penalty costs for underloads have been eliminated. Accidents in transit have been reduced because of better and more uniform loading of cars. Back strains and other injuries suffered by workers when hand loading wood have been reduced.

We formerly received 40 per cent of our rail wood in box cars, which necessitated unloading these cars by hand at the mills. In 1959, 99.9 per cent of our wood was received in open rack cars which were all unloaded by machinery at a substantial savings in labor costs. The average loadings on rack cars previously amounted to 16 cords per car hand-loaded. These same cars now average 21 cords, which results in greater revenue to the railroads. Instead of a railroad crew switching an occasional car at possibly 6,600 railroad sidings, the crews switch a dozen or more cars every day or two from 218 stations, with considerable savings in railroad crew time. Instead of a rail car making 1.5 complete turns per month, this ratio has doubled so the railroads are able to move twice the tonnage with the same number of rail cars.

Freight costs in 1959 were 25 per cent lower than in 1950 due to purchasing 93 per cent of the rail pulpwood at 218 mechanized concentration yards.

In retrospect, this type of mechanization could have been started years sooner since similar material handling machines were being used to move freight, lumber, coal, iron ore, and other materials. It was a question of concentrating pulpwood loading to a lesser number of loading points and, thus, make it economically possible to use equipment and installations requiring larger capital investments.

2 Million Man-Days

According to a study, "Pulpwooding with Less Manpower," published in 1957 by the Southern Forest Experiment Station, it required .6 man-hour per cord to transfer pine pulpwood by hand from a truck to a railroad rack car as opposed to .1 man-hour at a mechanized yard. On the basis of our company's rail shipments of 3,300,000 cords, this would represent a manpower savings of .5 man-hour per cord, or 206,250 man days as a result of the mechanical loading versus hand loading. There are additional manpower savings in that only the truck driver is necessary to deliver the wood whereas a helper must accompany the driver when wood is manhandled at a way station. Assuming 2.5 cords per truck load, it required 1,320,000 truck loads to deliver the necessary 3,300,000 cords. Total round trip travel time of each truck would amount to an average of two hours. Therefore, by eliminating the helper's time, which is not needed at mechanized yards, this amounts to 2,640,000 man-hours, or 330,000 man days. Adding the two elements of savings in manpower, we arrive at a total of 536,250 man days which were available to the thousands of three-man crews to do productive work in the woods and increase their man day production rates. It is within the realm of reason that all mechanized woodyards have conservatively saved over 2,000,000 man days in 1959.

This mechanization of loading and unloading may give you the impression that we have added about 10,000 men to the unemployed list. As a matter of fact, we are faced with a growing shortage of pulpwood cutters. The rapid growth of all types of industry and the growing mechanization of farms in the South resulted in a steady migration of farm labor to the industrial urban areas. We are heavily dependent on this diminishing farm population for woods workers to produce the paper industry's ever increasing requirements.

Analyzing man-day production rates on the basis of felling, limbing, bucking, loading, and hauling pulpwood to a rail head, barge landing, or the mill, the average production 25 years ago was approximately one cord per man-day. Today, due to improvements in power saws, trucks, and better highways and mechanized yards, this average has increased to approximately 1.5 cords per man-day. Although this appears to be an appreciable gain, this rate should have more than doubled to keep pace with rising living costs. A higher man-day production rate will provide sufficient margin to pay higher wages and attract dependable skilled workers.

How to Improve Roll Condition for Web Offset Printing

An ever increasing number of web fed offset printing presses demand uniform quality rolls. Read how Oxford employs a caliper profiler to assist the papermaker to develop a suitable product.

Arden Dubert,
Project Assistant to Superintendent,
Oxford Paper Co.,
West Carrollton, Ohio

For those of us in the field of publication paper manufacture, the term roll condition is one that presents itself more and more every day. With the ever increasing number of web fed offset printing presses going into use all over the country, the papermaker has recognized roll condition as one of the primary quality considerations.

Demands of Web Offset Press

Stop for a minute and think of the demands that a modern web offset press places on a sheet of paper. For example, we may have a press which prints a 70 inch wide sheet at 1000 feet per minute, this web of paper being continuous, thanks to the advent of the flying paster. After printing and drying through a high temperature oven, this web is usually perforated, folded, sheeted or converted in some other manner. Not only must this sheet of paper yield a printing job which is satisfactory to the customer, but it must also run smoothly on the press without excessive waste and downtime.

Many of us have watched web offset presses in operation and have observed that an occasional roll will wrinkle over feed rolls or in the printing nip. Sometimes these wrinkles will even break the web, especially at roll change when a flying paster is employed. A break costs the printer valuable press time in addition to the wrinkled waste. Oftentimes, too, even though wrinkles do not occur, a severe baggy condition may contribute to misregister and waste.

It is common knowledge that hard and soft spots in a roll of paper are not conducive to good press performance. But, on the other hand, why will a roll which has an obvious variation in density often run better than a roll which sounds perfectly uniform across the width? It is recognized that the basic problem of building good rolls that will draw evenly and run well through the press starts at the forming end of the paper machine itself, and involves such considerations as head box design, forming boards, grooved rolls, deflectors, etc., all directed toward producing a web of uniform spread, formation and profile. In attempting to answer these questions, papermakers have explored the possibilities of variation in moisture, basis weight, caliper, winding, etc. Although many factors appeared to directly or indirectly affect roll condition, it was felt that caliper was a logical starting point.

Studying Effect of Caliper

Early work consisted of graphing the thickness at various points across the top of a web offset roll and comparing this profile with performance of the roll on the press. Although this method did not enable the manufacturing department to ship or reject rolls solely on the basis of caliper profile, it did reveal that there existed a definite correlation between roll performance and caliper uniformity and that this correlation was worthy of further study.

In reviewing this early work, it was felt that the method of graphing caliper left much to be desired. First, to test and plot caliper was much too time consuming. Second, even a graph of points taken every two inches across the roll did not give a true indication of the width, shape or severity of any ridges or depressions. It was at this point that the decision was made to further the caliper study with the aid of a Foxboro Caliper Profiler.

Instrument-recorded profiles were then compared with roll performances in the same manner as before, and, as expected, results were more encouraging. For instance, it appears that many hard places which could cause press trouble are not discovered by feeling the roll since the rise in caliper is gradual enough not to be noticed. Also, these hard places may pass the "sounding" test since there may not be much variation in frequency with a tightly wound, otherwise uniform roll. By the same token, an obviously nonuniform roll may run perfectly because it has the type of defect which can be compensated for on the press. For example, a roll of paper which is hard on one end and soft on the other may have a uniformly sloping caliper that can be transformed, with the aid of a compensating roll, into an evenly taut sheet in the printing nip. Although an infallible method of predicting roll performance is still beyond the scope of the papermaker, it might be worthwhile to mention that knowledge of such press features as length of draws, angle of draws, location and type of compensating rolls, if any, sheet tension, and of course, width and diameter of paper roll, contribute greatly toward this end.

Maintaining a Uniform Reel

The Caliper Profiler has also played an important role in determining the cause of wrinkles, soft places, hard places and other mechanical defects in the reel winding up on the paper machine.

The following is a selected case illustrating how the instrument can be used to pinpoint defects.

The problem is pictured in Figure 1. Routine control tests show that the reel contained a soft end with a hard ridge four inches from the back side of the reel. This characteristic is ob-

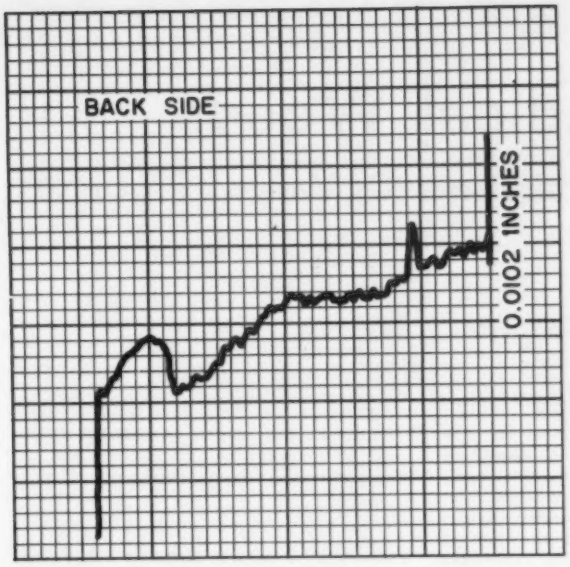


FIGURE 1. Tearout at reel.

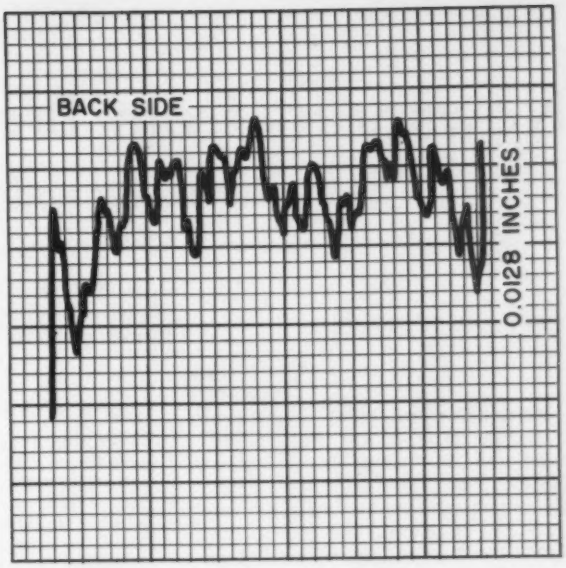


FIGURE 2. Tearout before first calender stack.

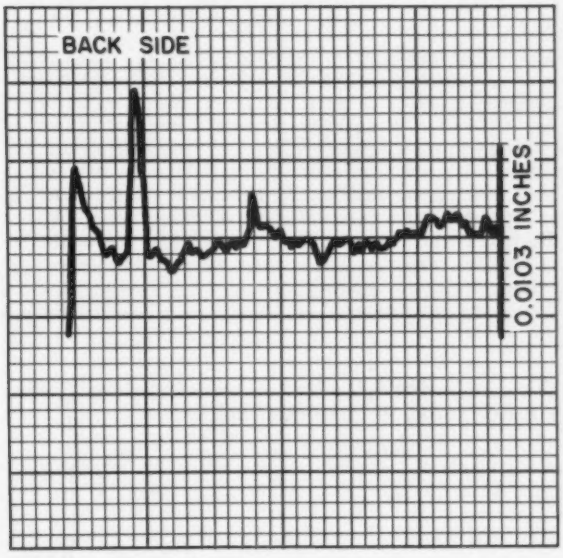


FIGURE 3. Tearout after first calender stack.

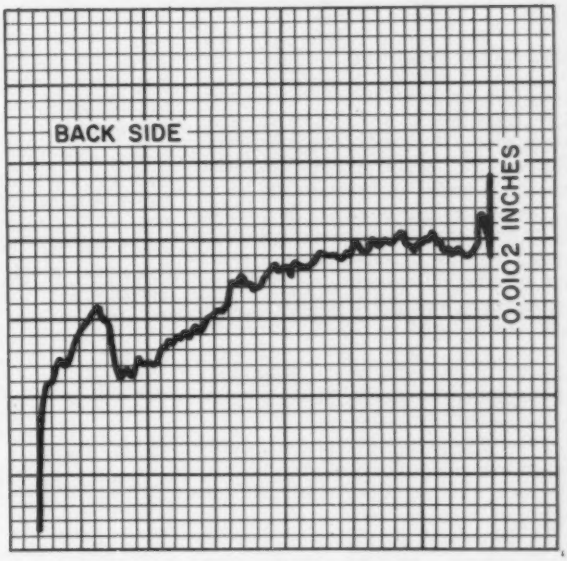


FIGURE 4. Tearout after second calender stack.

jectionable from a mechanical standpoint because it may result in an uneven skid if the paper is sheeted or it may wrinkle when printed on a web offset press. Figures 2, 3 and 4 represent tearout samples which were taken in an effort to isolate the cause. Each small square in the horizontal direction on the charts represents one inch of sample. Each small square in the vertical direction represents one ten thousandth of an inch in caliper. Each sample consisted of four thicknesses of paper.

The particular paper machine to which this problem pertains, has two six roll calender stacks and one four roll stack, located after the size press.

Profiler Pinpoints Defect

Figures 2, 3, and 4 indicate that the problem with which we are concerned was not present before or directly after the first calender stack, but that it showed up after the middle stack. In this particular instance, the solution was obvious once the defect was traced to a particular stack, however, this same method could have undoubtedly been employed to pinpoint a particular calender roll.

This procedure for determining the cause of undesirable paper qualities is simple and fast. The required samples can be secured and processed in a few minutes without causing a web break. It has also served to eliminate much trial and error in paper machine adjustments. Another feature of the Caliper Profiler is its ability to reveal the amount of calendering done at any particular point in the system, thus allowing one to study the effects of moisture, loading, etc.

Indications are that caliper will play an increasingly important role in quality control programs geared to web offset and that the Caliper Profiler will find wide use in assisting the papermaker to develop a product suitable for modern printing and converting operations.

Newsprint from Broadleaf Woods

Suitability and Limitations Of Various Processes

J. N. Swartz,
Technical Director,
Bowaters Southern Paper Corp.

Most newsprint today is made of a mixture of 70-80 per cent groundwood and 20-30 percent unbleached sulphite or semi-bleached kraft. These pulps are made almost entirely from the coniferous woods—spruce, balsam fir, hemlock, and the southern pines. During recent years substantial utilization has been made of indigenous and plantation pine species in other countries.

Newsprint Qualities

Let us consider briefly the properties required in a modern sheet of newsprint. It must perform satisfactorily in two respects: (a) runnability; and (b) printability.

By runnability is meant the ability of the sheet to run in modern high speed presses without web breaks. To satisfy this condition the sheet must possess ample strength in tear and tensile, and be free of physical defects, as cuts, holes, slivers, wrinkles; the rolls must be round, firm and evenly wound. Uniformity is of prime importance.

Printability is a collective term describing the ability of a sheet to produce the required standard of printing reproduction.

Modern news machines operate at high speeds; present installations cannot be justified on a capital basis unless speed ranges from 2,000-2,500 f.p.m. are maintained.

The inlet and headbox of machines operating in the 1,000 f.p.m. range were totally inadequate at 2,000 f.p.m. The old equipment was designed with baffles and multipass inlets, resulting in turbulence. A deep pool was necessary to maintain stock velocity at the slice; circulation was poor and flocculation resulted. The air loaded headbox and high velocity inlet, direct connected to the fan pump, corrected this condition. Rectifier rolls were incorporated to control the flow in the headbox. An appreciation of the mechanism of drainage of stock on the fourdrinier wire has resulted in improvements in sheet formation and two-sidedness by incorporation of forming boards, grooved table rolls, baffles and deflectors.

Probably the most critical point on a news machine is the open draw between the couch and the first press felt; it is at this point that the wet sheet (80 per cent moisture) must cross an unsupported space. The adoption of the vacuum transfer principle has been one of the main contributing factors in raising newsprint machine speeds from 1,800 to 2,500 f.p.m. Wet strength at the couch draw is no longer so critical; this is of particular significance in hardwood utilization, where weak wet web strength is likely to be encountered.

The calender stack has become a critical area in modern newsprint operation; specifications of newsprint dictate uniform finish and caliper. The modern stack is designed to give maximum finish; simultaneously to maintain caliper, crown is closely controlled and the weight of the rolls is counterbalanced pneumatically. This new development in calendering is particularly interesting in hardwood utilization where chemical pulps may be high density, lacking bulk.

Since this paper was given at a forestry conference it contained much information of an elementary nature to our readers. The editors, therefore, condensed this paper by eliminating the type of information that is common knowledge to our readers.

Condensed from a paper presented at the Fifth World Forestry Congress, Aug. 28-Sept. 10, 1950.

TABLE I

STRENGTH PROPERTIES OF NEWSPRINT FURNISH

Pulp	Ratio			Ratio		
Semi-Bleached Pine Kraft	25					
Pine Groundwood	75					
Spruce-balsam Sulphite				25		
Spruce-balsam Groundwood				75		
	Actual			Actual		
Quality-Strength	Wet (a)	Dry (b)	Calc.	Wet	Dry	Calc.
Canadian Standard Freeness	125	110	206	140	226	223
Bulk cc./gm.	2.15	2.07	2.23	2.20	2.06	2.30
Burst Factor	18.8	14.0	19.5	16.0	16.8	22.9
Tear Factor	75	67.2	62.5	52	63.4	49.8
Tensile, meters	2900	2800	3550	3500	3250	4170

STRENGTH PROPERTIES OF PULPS

Pulp	CSF	Bulk	Burst Factor	Tear Factor	Tensile
Semi-Bleached Pine Kraft	600	1.45	48	130	7000
Pine Groundwood	75	2.50	10	40	2400
Spruce-balsam Sulphite	630	1.40	47	64	6500
Spruce-balsam Groundwood	85	2.60	15	45	3400

(a) Wet couch trim

(b) Dry paper soaked overnight and disintegrated

Pulp Strength Requirements

It has been previously noted that the physical characteristics of the sheet are well defined. The relationship between qualities of virgin pulp supplied to the machine and finished paper is not a simple one, due to recirculation of fines in the system, reworking of dry broke, chemical additions, and characteristics of a dry sheet as compared to wet pulp. It has been found, however, that the wet sheet as it leaves the wire at the couch does approximate in certain physical properties values calculated from the individual components determined from the simple mixing law.

In Table I are shown actual and calculated values for two paper machines operating on 25-75 ratios of pine kraft and groundwood, and similarly spruce-balsam sulphite and groundwood. The actual values are those of the wet sheet at the couch, and may be considered as representative of newsprint furnish. The calculated values agree sufficiently to make this method a useful tool in estimating the value of a pulp in a paper furnish.

It is not surprising that the freeness values are wide apart. The bulk (cc's per gram) as calculated, burst and tensile values are slightly high, while calculated tear factor is low.

The finished paper at the reel was disintegrated, hand-sheets made, and tested; these results are not too different from those at the wet end of the machine.

It is not the inference here that handsheet tests as shown will determine paper properties; such tests will indicate when made on standard handsheets whether the fiber components could be combined to give a handsheet similar to a sample of desired properties. There are other necessary comparisons required, a few being porosity, fold, stiffness, optical properties. The wet strength properties are important, particularly on the older open draw machines where transfer of the wet web from the fourdrinier to the press section is a critical point in the operation; it has previously been shown that the vacuum pickup has improved this condition. Nevertheless, particularly with hardwood pulps, wet strength properties must be carefully observed. After preliminary laboratory conditions have been satisfied, trial runs must be made, first on pilot plant machines, then on wider and faster commercial units. This has become standard practice in the industry.

TABLE II

HARDWOOD PULPING PROCESSES

		Yield	Energy HP Days/Ton
A. Mechanical Treatment		90-95%	65-75
1. Conventional groundwood			
2. Groundwood from chips			
B. Mild Chemical—Mechanical Treatment		85-92%	40-70
1. Chemi-groundwood			
2. Chemi-mechanical	Cold caustic, neutral sulphite, bisulphite		
C. Moderate Chemical—Mechanical Treatment		60-85%	10-20
1. Semi-chemical	Neutral and acid sulphite and bisulphite Ca, Mg, NH_3, Na base kraft soda		
D. Extensive Chemical	Acid sulphite and bisulphite kraft soda	43-52%	5-10

Hardwood Pulping For Newsprint

A very broad classification of our modern pulping processes would be chemical and mechanical; in recent years there has been considerable development in mechanical-chemical processes, and this has been concurrent with revived interest in high yield acid pulping. Some of these modified pulping processes seem particularly adapted to hardwood pulping, producing hardwood pulps in high yield, in certain cases equivalent and even superior in strength to the corresponding products from coniferous woods.

The commercially employed wood pulping processes have been very well classified by Janes (1).

In Table II is shown a broad classification of pulping processes, applicable to a discussion of hardwood utilization.

Conventional Groundwood

In Table III is shown a comparison of commercial groundwoods used in production of newsprint. The spruce-balsam mixture represents an average of ten Canadian newsprint mills and contained about two per cent poplar. The southern pine groundwood is made from a typical mixture of southern yellow pines, short and longleaf, loblolly, with possibly a small amount of virginia. The pine groundwood is somewhat inferior in strength and bulking properties when compared to the northern mixture, as has been discussed earlier.

Although the high density hardwoods are not suitable for grinding, considerable application of the low density woods, as poplar, cotton-

TABLE III

CONVENTIONAL GROUNDWOOD

	Freeness CSF	Burst Factor	Tear Factor	Bulk cc/gm	Tensile Meters	HP Day/Ton	Brightness G. E.	Ref. No.
Spruce-balsam	90	15	45	2.65	3400	65	58.0	8
S. Pine	65	11.5	39	2.40	2350	70	58.0	
N. Poplar	81	9.8	34	2.32	3130	75	55.0	2
	82	9.3	25	2.45	2190		57.6	9
S. Cottonwood	104	5.3	26	2.69	1580	70		2
S. Cottonwood	91	6.8	24	2.71	1620		58	10
Gewa	170	7.8	32	2.70	1660		61.5	5
Sugar Maple	165	12.7	27.5	2.22	3100		43.5	
Black Tupelo	85	8.9	26	2.30	2640		57.5	
Sweet Gum	103	6.6	19.6	2.28	2230		45.2	
Cottonwood	60	13.8	35.4	2.00	3240		50	
Eucalyptus	39	7.0	18.0	2.70	1670			7

wood and willow, has been made. The Ontario Paper Co. at Thorold, Ont., has used poplar regularly in their newsprint furnish since 1942 **(2)**.

"Power, of course varies with freeness, strength, etc. Originally 80-85 h.p. days per ton was used, but this has now been reduced to 68-70 h.p. days per ton, but strength has suffered. The production 28 tons per stone per day as compared to 37 tons for spruce. (63-65 h.p. days) We are using 5,000 feet per minute peripheral stone speed and 83 grit stones."

Brecht **(3)** reports that, "While poplar can be ground with less energy than spruce to make a groundwood pulp which drains easily and makes soft, low density papers of high absorbency, its strength properties are much lower than those of groundwood made from spruce. It is a matter of fact that the speed of Italian newsprint machines does not exceed 900 f.p.m., despite additions of chemical pulp amounting from 27 to 30 per cent."

Early in 1954, trials conducted at the Forest Products Laboratory indicated the possibility of using up to 40 per cent of aspen, cottonwood or other hardwood groundwood pulp in a newsprint furnish, with the balance consisting of varying proportions of hardwood semi-chemical pulp, pine or spruce groundwood and semi-bleached pine kraft.

In Table III are shown tests on commercial cottonwood groundwoods; there is no doubt that the pulp is low strength and high bulk as compared to the coniferous woods and also poplar. Nevertheless, there has been a considerable expansion in the use of cottonwood in coating base stock (50 per cent kraft coniferous—50 per cent cottonwood groundwood); actually the quality requirements of such a sheet are higher than for newsprint. It is lighter (24 lb. as compared to 32 lb. 24 x 36 - 500 basis), stronger, must have good formation, densometer, and bulk. Champion Paper & Fibre Co. at Pasadena, Tex., has been successfully making such a sheet from cottonwood groundwood since 1955. A small percentage of hardwood is also used with the bleached pine kraft. More recently, Crown Zellerbach has commenced operation at St. Francisville, La., using cottonwood as its main source of groundwood.

The first newsprint mill to operate entirely on hardwoods, it is reported, will commence construction in the near future. Noralyn Paper Mills, Inc., has projected such an operation in Louisiana to use the delta hardwoods such as cottonwood, gum and hackberry. The processes to be used have not been disclosed. "Newsprint has been developed using 100 per cent hardwood furnish by the Herty Foundation and this process has been successfully reduced to practice. Newsprint made from Herty prepared stock has been run on a commercial machine and the paper has printed successfully on high speed presses with excellent results." **(4)**

It is known that about five tons of newsprint was made from Herty produced furnish at Combined Locks, Wis. This paper was run at speeds up to 45,000 copies per hour by the Milwaukee Journal, New York Times, and Savannah Evening Press, producing excellent printing results without a single web break. Admittedly, the paper made in Wisconsin was produced at relatively low machine speed on a specialty machine; nevertheless, the results are impressive and projection to modern high speed machine operation should be possible without any major difficulties.

It is surmised that the process consists of about 60 per cent low density groundwood, with 40 per cent bleached neutral sulphite semi-chemical made from gum.

At the Khulna Newsprint Mill in East Pakistan, "gewa" wood is being successfully used **(5)**. In the Khulna mill only groundwood and chemi-groundwood are produced from gewa. No NSSC pulping is done. Imported semi-bleached kraft pulp is used as the long fiber component; 8-15 per cent in newsprint and 20-30 per cent in mechanical printings. Brightness of 53-55 (G. E. equivalent) is attained without bleaching.

It is well known that the groundwood process is not suitable for higher density hardwoods (above 0.40 S.G.). Nevertheless, such pulps have been made commercially and used. Laboratory tests on sugar maple, black tupelo and sweetgum as compared to cottonwood are shown in Table III **(6)**. Grinding these species produced pulps containing practically no long fiber fraction. It was found that modification in grinding pressure could produce fairly satisfactory pulps from cottonwood and poplar, but even under optimum conditions this was not possible with the higher density species. Again, note that these are laboratory comparisons.

An example of the application of high density woods is that of the eucalypt species by Australian Newsprint Mills at Boyer, Tasmania. This mill operated on 80 per cent eucalypt wood and 18.5 per cent Canadian sulphite, or Swedish kraft, and more recently semi-bleached kraft from pinus radiata from New Zealand. More recently part of the groundwood has been removed and supplemented by cold soda pulp, also from eucalyptus. Tests on eucalyptus groundwood are shown in Table III **(7)**.

Groundwood from Chips

During the past few years there has been considerable interest in reduction of chips to groundwood in disk refiners and screw presses. It is claimed that wood waste can in this way be utilized, the process is more flexible, operating and capital costs are lower, et cetera. Mechanical treatment of the denser hardwoods without prior chemical treatment results in "wood flour" with little strength. Table IV shows the effect of mechanical pressing followed by double disk refining on spruce, and poplar as an example of a low density hardwood.

In these cases the pulp appears as an example of a low density hardwood. In these cases the pulp appears superior to stone ground wood. The very low strength characteristics of the denser hardwoods is shown in the results obtained with birch and gum. Obviously prior chemical impregnation is required in these cases.

TABLE IV

GROUNDWOOD FROM CHIPS (NO CHEMICAL TREATMENT)

	Freeness CSF	Burst Factor	Tear Factor	Tensile Meters	HP Days/Ton	Brightness G. E.
Spruce	71	25.2	75	4830	94	55 (13)
Aspen	82	11.2	34	2970	74	57
Birch	159	3.0	12.3	1175	61	49
Black Gum	71	3.1	12.0	1180	67	56

Chemi-Groundwood

The basic work on chemi-groundwood has been well outlined **(3)** **(12)** **(13)** **(14)**. Sweet gum and paper birch, examples of southern and

northern high density woods, were subjected to a vacuum-pressure treatment in a sodium sulphite-sodium carbonate solution. The pulps prepared from the untreated woods were short fibered and generally low in strength, with practically no long fraction (ret. 24 mesh) and 60-80 per cent of the fiber passing 150 mesh screen. After chemical treatment grinding resulted in pulps of higher freeness and greater fiber length, which were produced at higher rates of grinding and much lower energy consumption than those made from the untreated woods under the same grinding conditions. Pulps made from the pre-treated birch were higher in bursting and tearing strength, as well as tensile in some cases, as compared to the untreated wood. The pre-treated sweet gum did not improve and in some cases is inferior to the untreated wood (12).

Aspen, birch, beech, and hybrid poplar were treated under conditions more drastic than those described above (140-170° C. for six hours) (13). The improvement in strength as compared with untreated wood is quite remarkable. This is accompanied by a decrease in brightness and opacity and increased density. Chemi-groundwood pulps of exceptional strength can be prepared from hybrid poplar; the brightness is excellent, but high temperature results in considerable decrease, at temperature of 170° C. This work has been confirmed by further work at the Forest Products Laboratory (14); results on several hardwoods indicated that mild treatment only slightly affected strength, brightness and density, but increasing the severity of the pre-treatment increased the strength and density of the pulp and decreased the brightness and opacity. Single stage hypochlorite treatment easily brightens the pulps.

Although laboratory results have indicated that denser hardwoods, as eucalyptus and oaks, may be handled in this process, commercial results have been disappointing, and the maximum density range would appear to be 0.50-0.55. Penetration of liquor throughout a whole log appears to be an unpredictable factor causing non-uniformity of the groundwood.

The largest installation of the Chemi-groundwood process[1] is at Great Northern Paper Co., Millinocket, Me., (15) (16). Four foot barked wood is used, aspen, balm of gilead, maple, birch, and some beech. The low and higher density woods

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are kept separate. This plant is capable of producing 400 tons per 24 hours in four digesters. The cooking is essentially a mild neutral sulphite semi-chemical type of cook. Grinding is carried out in conventional grinders at about 30-35 h.p. days per ton.

A fine sheet of newsprint is being produced from 25 per cent chemi-groundwood (360 c.s.f.), 20 per cent sulphite and 55 per cent conventional groundwood (85 C.S.F.).

The first Chemi-groundwood plant in Europe is located at Corbehem, France, at Societe F. Beghin, S. A. Its capacity is 100 tons per day; the design and operation are substantially similar to that at Millinocket (17). Paper machine equipment is modern, including suction press transfer arrangement. The fiber components of the furnish consist of 21 per cent imported sulphite, 23 per cent poplar chemi-groundwood, and 56 per cent conventional groundwood; in addition, 5 per cent clay is added. Machine speed is 1900 f.p.m.

Reference has been made earlier to the use of chemi-groundwood at the Khulna newsprint mill in East Pakistan (5).

Cold Soda Process

The reactions occurring during cold caustic treatment are not too well understood. Suffice is to say that sodium hydroxide reacts with materials in the fiber cell wall. Although only a small amount of lignin is dissolved (±1 per cent), the removal of hemicelluloses and pentosans may be considerable, 5-10 per cent, depending on the conditions employed. The cellulose surface exposed becomes much more susceptible to mechanical treatment and strength development than the original wood. It may be stated empirically that for any species the reaction depends on concentration, time, temperature, and the "response" of each species varies (18). Birch, poplar, sweet gum, black gum, beech, maple, and oak responded in descending order. In general, strength properties followed the degree of fiber separation and swelling of the secondary cell wall under the action of caustic.

Steeping times of 1-2 hours are usually employed at room temperature. If 30° C. is exceeded there is a darkening of the chips. It has been stated that prior evacuation followed by hydrostatic pressure improved the uniformity of chip impregnation. Commercially it has been found that the reaction is largely dependent on surface area of the wood exposed to the chemical, and that pressure is of little advantage (19) (20) (21) (22) (23).

Commercial installations of the cold soda process include the following. Prior defiberizing of the chips is advocated by Sprout Waldron. The chips may then be steeped in 25-50 g.p.l. caustic in pressure or atmospheric units. The Bauer rapid cycle digester under pressure is used at Gould, Coosa Pines, Fuji Mill of Daishowa Paper Manufacturing Co. (Japan), and Tohokui Pulp and Paper Co. Similarly, pressure units as the Grenco or Pandia may be used for continuous operation. Globe digesters may be used either as soakers at atmospheric pressure or at elevated conditions, Stone Container, Australian Newsprint (7). Tower units may be used as soakers, as at Continental Can (Augusta) or Champion (Pasadena). The M & D (Bauer) cooker may be used similarly as at Bowaters Southern.

The Haug Kollermill was early advocated by the Forest Products Laboratories. The principle of mechanical treatment in the presence of alkali is excellent. Cartiera Vita Mayer, Milano, are impregnating by using roller type mills; the air and moisture are squeezed out of the chips and since the discharge side of the roller is submerged in chemical, the chip is impregnated. A retention stage of 7-8 minutes is provided; this process is repeated three times (24). Similar processes using screw-type presses are being investigated, and one such unit is in operation at Filer City (American Box Board, Packaging Corp. of America).

Following steeping the chips are drained to 60-65 per cent moisture content. Liquor may be recovered by using a screw press which raises the fiber content to 60 per cent (40 per cent moisture). This also constitutes an important part of the defibering stage. The drained liquor may be reused or go to a recovery process (25). Refining of the pulp

[1] Only one on this continent

occurs in two or three stages, with intermediate screening and centrifugal cleaning. Depending on the end use of the pulp, i.e., final freeness, power requirements may range from 50-100 per cent of that of stone groundwood.

Since cold soda pulps are usually darker than regular groundwood, bleaching may be required; this reduces the opacity of the pulp, but may result in some strength improvement. Chlorine, hypochlorite, peroxide and hydrosulphite are used (26). Since bleaching will cost approximately $1.00 per point, the economics must be carefully considered.

The Daishowa Co. at Yoshiwara, Japan (27), produces 60 metric tons daily of cold soda pulp for newsprint. The pulp is produced in the Bauer rapid cycle digester, followed by pressafiners, double disk refiners and hypochlorite bleaching. Newsprint is manufactured at approximately 1500 f.p.m. on a furnish consisting of about 40 per cent cold soda pulp, 50 per cent groundwood, and 10 per cent hardwood kraft pulp. A modern kraft and newsprint mill is being built near Sapporo, Hokkaido, by the same company. Paper machines are designed for 2,500 f.p.m.; equipment is being installed to produce 120 tons per day of cold soda or high yield NSSC pulp, as part of the newsprint furnish.

Wood species available to the mill are typical of Hokkaido Island hardwood, 75 per cent birch and 25 per cent alders.

The Tohoku Co. in Honshu (27) commenced operations in May 1959 of a 30 metric ton per day cold soda hardwood pulp mill. This furnish is being added to their newsprint, and is also being expanded.

Pulping Hardwoods by Sulphite Processes

In Table II sulphite pulping has been subdivided into "mild" and "moderate" chemical treatment. It is more convenient to discuss these together. In this section will be considered the various processes using sulphur dioxide, combined with an alkali. The higher yield semi-chemical processes are of primary interest here in view of their adaptability to hardwood pulping.

Neutral Sulphite Pulping

In neutral sulphite semi-chemical pulping a solution of sodium sulphite and bicarbonate is used, usually in the ratio of about four to six parts sulphite to one carbonate. Pulping occurs on the slightly alkaline side, to prevent acid hydrolysis, while the alkalinity is not high enough to remove any major portion of the hemicellulose. Cooking chemical requirements are 15-20 per cent expressed as sodium carbonate to wood. The relationship between the amount and ratio of chemicals, pH, temperature, and cooking time is not a simple one. Low density hardwoods generally produce better pulps than the denser woods; popular, aspen, cottonwood, and birch produce excellent strength pulps, although there is a tendency to brittleness with low opacity (31) (32) (33).

For the manufacture of newsprint, NSSC pulps may be produced whose characteristics are between those of regular groundwood and the long fibered part of the furnish. To produce maximum strength, mechanical treatment is necessary, which reduces opacity and results in "tinniness"; the degree of treatment must be compromised with the other components in the furnish to produce the desired result.

Newsprint has been made for years at Richmond Pulp and Paper Co. in Canada, with NSSC pulp in the furnish (34). Sulphite pulp has been either partly or completely replaced on three paper machines operating in the range 1,150-1,600 f.p.m. Semi-chemical pulp gives higher tensile and burst strength and slightly lower tear. The printing and running qualities of this sheet are well regarded in many high speed pressrooms.

Proposed use of NSSC, although not fully disclosed, is probable at Noralyn, as has been previously discussed.

The Stora Kopparberg mill at Kvarnsveden is utilizing about 75 tons per day of its modified neutral sulphite pulp from birch newsprint (35) (36). The continuous cooking equipment used is by Defibrator; the process consists essentially of presteaming, pre-impregnation, with hot NSSC liquor for 5-15 minutes, a 30-60 minute cook at 160-180° C. and 110-130 p.s.i. The pulp flashes through the plates of the Asplund Defibrator, to a cyclone and de-watering press. Two stage refining is used followed by centrifugal cleaners.

The liquor is prepared by introduction of SO_2 into a 10 per cent caustic solution. The initial pH during the cook is 7.5, but due to lack of buffering during the cook the pH drops to 5. This results in an accelerated cook, with high brightness, approximating bisulphite cooking to be discussed later. The birch wood used is of very high quality, straight, clean and white.

Pulp yield is about 85 per cent. Brightness ranges 65-67 G. E., which is better than the mill's spruce groundwood and sulphite. Pulp strength is much higher than the groundwood and approaches that of unbleached sulphite. The NSSC pulp is used to make up 10 to 15 per cent of the newsprint furnish. There is a slight increase in porosity and brightness of the newsprint; the hardwood furnish improves the formation of the sheet due to drainage conditions on the wire. The successful use of birch at Kvarnsveden is the beginning of a tremendous expansion of hardwood utilization in the Scandinavian countries.

In March 1958, Jujo Paper Manufacturing Co., Kushiro, Hokkaido, commenced operations of 40 tons per day hardwood sulphite for use on their high speed news machine. Approximately 40 per cent hardwood pulp, 50 per cent groundwood, and 10 per cent sulphite are used as furnish. Another high speed machine (2,500 f.p.m.) is being planned; the hardwood plant is being increased in capacity to 200 metric tons daily.

Bisulphite Pulping Possibilities

It has been mentioned above that chemical requirements in NSSC cooking are 15-20 per cent based on soda ash to wood, and that sulphiting is controlled to give 4-6 parts sulphite to soda ash. There had been some indication earlier that improvements could be made in this procedure. Husband (37) (38) demonstrates that, "70-80 per cent yields of semi-chemical pulps having greatly improved strength characteristics could be prepared from both birch and maple woods using not more than 8.4 per cent sodium carbonate and 2.5 per cent sulphur as the sole chemical additive." Note that this is substantially a solution of sodium bisulphite. He points out that there is little advantage in the use of more chemicals; that the system employed is sodium bisulphite buffered within the pH range 3.7 to 5.8 (acetate range) by acetic acid derived from the wood, hardwoods particularly. It was later demonstrated that sodium bisulphite semi-chemical pulps at 70 per cent yield could be prepared from white birch wood at 180° C. in 15 minutes or less (39).

TABLE V

HARDWOOD PULP BY DIFFERENT PROCESSES

Process	Chemi-Groundwood		Cold-Soda			Sulphite
Wood Species	Mixed Hardwood	Gewa	Mixed Oaks	Bleached Mixed Hardwood	Eucalyptus Regnans	Birch
CSF	360	460	95	332	142	612
Bulk	2.30	2.00	2.00	1.95	2.35	1.93
Burst	23	25	19	20	22	24.9
Tear	63	81	59	44	45	59
Tensile		4790	3750	3580	3700	4060
Brightness	42.5	56.5	41	59	55	67

The significance of this work was soon realized **(40)**. The Arbiso process demonstrates that poplar, maple and beech yield pulps somewhat inferior to birch, although in each case far superior to an acid sulphite cook. Mixtures of hard and soft woods may be pulped. Mill bleaching and paper machine trials have confirmed the high quality of Arbiso pulps.

The Magnefite process **(41)** involves the use of magnesium bisulphite for digestion; the cooking liquors, in the range of pH 3.5-5.0, may be used to pulp coniferous woods, including pine, and the pulps from mixed hardwoods are superior to those made by the conventional sulphite process. The results reported to date are concerned mainly with bleachable grades; there is no doubt that this process should be extremely useful in production of high yield pulps from hardwoods.

The information available on high yield acid or bisulphite pulping of hardwoods in the 75-90 per cent range is meager. C. K. Textor writes, "We think of this process as being impregnation only, without subsequent cooking and one which will produce yields of 90 per cent or better. You may remember that the brightness of these pulps was considerably better than those produced with cold soda and that many of them were 60 per cent G. E. and better." **(42)**.

It is fairly certain that pulps similar to those described, but in slightly lower yield (75-85 per cent), will be produced.

Conclusions

In Table I, various actual and calculated tests are shown as a basis of newsprint furnish. Let us assume the following minimum standards:

Bulk, cc/gm	2.10
Burst factor	14.0
Tear Factor	50
Tensile	3,000
Brightness, G. E.	56

Using the simple mixing law as previously, and typical strength tests it is not too difficult to construct an all hardwood furnish which will meet the above minimum standards. Several of the chemi-groundwoods are actually superior to that required. This also applies to the cold soda and the birch semi-chemical pulp. The tests on these pulps are shown summarized in Table V. These represent commercial pulps.

All samples except the E. regnans and oak cold soda are much too free draining and would be mixed with slower groundwood; as has been described previously, they are added to regular stone groundwood. Similarly, low bulk could be rectified in this manner. Strength properties are more than adequate in all samples except the cold soda from mixed hardwood and E. regnans. To these pulps pine kraft is being added. Caustic treatment of some hardwoods results in dark colored pulps which would require bleaching. Low opacity can be rectified using filler. This approach is essentially similar to that proposed by Forest Products Laboratories **(43)**.

Brown **(44)** estimated the following factors in manufacturing one ton of cold soda pulp for newsprint:

0.7 cords wood (oak)
155 lbs. caustic soda
40 h.p. days (fiberizing power)
86 lbs. lime (bleaching)
72 lbs. chlorine (bleaching)

Commercial practice has indicated that the above figures are accurate enough for estimation purposes.

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LITERATURE CITED

1. Janes, R. L., **Paper Trade Journal** 142, No. 8: 44-51 (Feb. 24, 1958).
2. Personal Communication, Franklin, G. A., The Ontario Paper Co.
3. Brecht, W., **Tappi** 42, No. 8: 664-669 (August 1959).
4. Personal Communication, Belvin, W. L., Herty Foundation.
5. Personal Communication, Sandwell & Co. (See also **Paper Trade Journal** 143 No. 32: 38-40 August 10, 1959).
6. Hyttinen, A. and Schafer, E. R., **Tappi** 32, No. 2: 79-85 (February 1949).
7. Bugg, E. J. and Pearson, A. J., **Appita** 12, No. 3: 57-87 (November 1958). Also in **Paper Trade Journal** 142, No. 51 16-28 December 22, 1958.
8. Report, Technical Section, CPPA, Mechanical Pulping Committee (December 1954).
9. Personal Communication, de Montmorency, W. H., Pulp & Paper Research Institute of Canada.
10. Personal Communication, Crown Zellerbach Corp., St. Francisville, La.
11. Textor, C. K., "Groundwood from Chips," The Bauer Bros. Co.
12. Hyttinen, A. and Schafer, E. R., **Tappi** 32, No. 2: 79-85 (February 1949).
13. Libby, C. E. and O'Neil, F. W., **Tappi** 33, No. 4: 161-178 (April 1950).
14. Hyttinen, A. and Schafer, E. R., Report No. 2015 (1955), U. S. Forest Products Laboratory.
15. Dentremont, A. E., **Paper Trade Journal** 139, No. 8: 32-42 (February 21, 1955).
16. Pollard, D. F., **Paper Trade Journal** 140, No. 44: 24-25 (October 29, 1956).
17. Anon., **Paper Trade Journal** 143, No. 50: 52-53 (Dec. 14, 1959).
18. Marton, R. G., "Structural Changes in Fibers During High Yield Pulping", **Tappi** (To be published).
19. Brown, K. J. and McGovern, J. N., **Paper Industry** 35, No. 1: 66-69 (April 1953).
20. Brown, K. J. and Monsson, W. H., **Tappi** 39, No. 8: 592-599 (August 1956).
21. Brown, K. J., **Paper Trade Journal** 142, No. 2: 28-34 (January 13, 1958).
22. Brown, K. J., Report No. 2101 (December 1957), U. S. Forest Products Laboratory.
23. Report No. 2126 (September 1958),

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24. Colombo, P. and others, **Tappi** 40, No. 9: 205A-207A (September 1957).
25. Swartz, J. N., MacDonald, R. C., and Hambaugh, P. C., "Kraft Liquor Sulphidity Control with Sulphuric Acid", **Tappi** (To be published).
26. Smedberg, G. E. and Stalter, N. J., **Paper Trade Journal** 141, No. 51: 20-25 (December 23, 1957).
27. Eberhardt, L., **Paper Trade Journal** 144, No. 8: 34-36 (Feb. 22, 1960).
28. Brown, K. J., Report No. 2101 (December 1957), U. S. Forest Products Laboratory.
29. Sprout Waldron Technical Report.
30. Chidester, G. H. and Brown, K. J., Report No. 2013, U. S. Forest Products Laboratory.
31. Chidester, G. H., **Paper Trade Journal** 129, No. 21: 84-89 (November 17, 1949).
32. Ceragioli, G., Keller, E. L., and Chidester, G. H., **Tappi** 40, No. 1: 8-14 (January 1957).
33. Sapp, J. E., **Paper Trade Journal** 130, No. 26: 22-24 (June 29, 1950).
34. Laviste, C., **Pulp and Paper Mag., Canada** 58, No. 9: 143-147 (August 1957).
35. Evans, John C. W., **Paper Trade Journal** 143, No. 34: 36-41 (August 24, 1959).
36. Personal Communication, Raine, T. L. and Kingsnorth, S., Bowaters United Kingdom Pulp and Paper Mills.
37. Husband, R. M., **Tappi** 36, No. 12: 529-534 (December 1953).
38. Husband, R. M., **Tappi** 38, No. 10: 577-588 (October 1955).
39. Husband, R. M., **Tappi** 40, No. 6: 412-419 (June 1957).
40. Dorland, R. M., Leask, R. A., and McKinney, J. W., **Pulp and Paper Mag., Canada** 60, No. 2: T37-T49 (February 1959).
41. Tomlinson, G. H., Tomlinson, G. H. II, Bryce, J. R. G., and Tuck, N. G. M., CPPA, Technical Section Proceedings, 132-138 (1958).
42. Personal Communication, Textor, C. K., The Bauer Bros. Co.
43. Report No. 2027 (March 1955), U. S. Forest Products Laboratory, Madison, Wis.
44. Brown, K. J., **Paper Trade Journal** 142, No. 2: 28-34 (Jan. 13, 1958).

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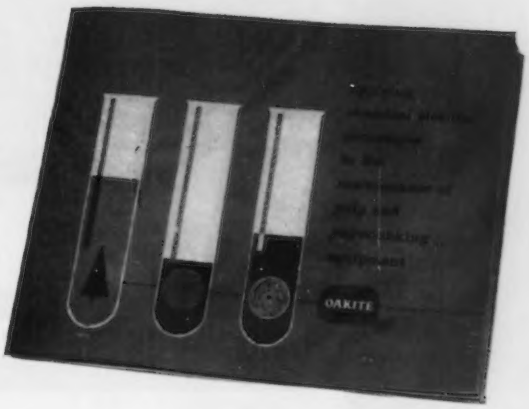

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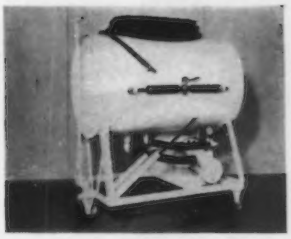

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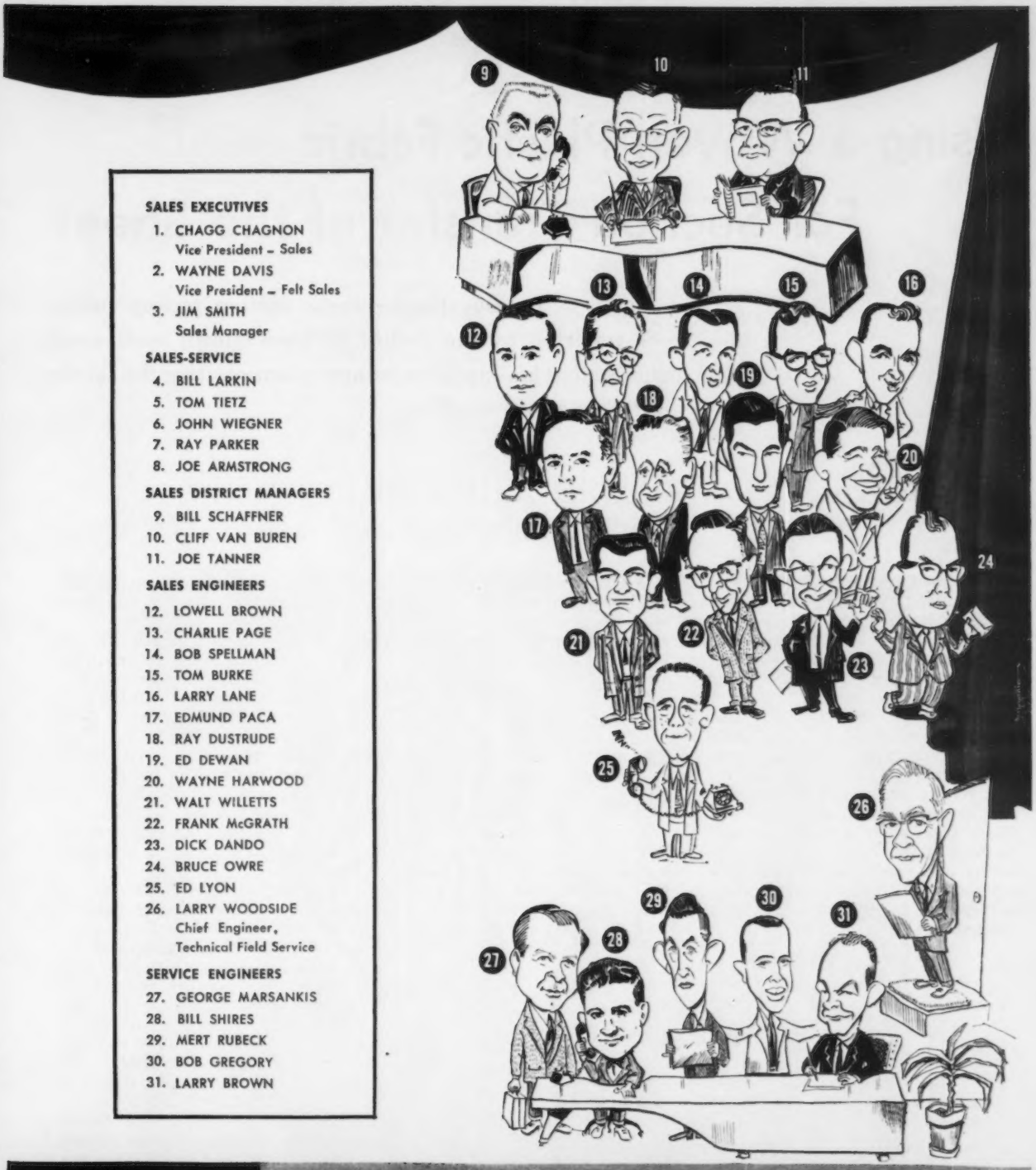

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The World's Largest Manufacturer of Paper Machine Felts

Using a Woven Plastic Fabric For Suction Transfer of the Sheet

A brand new innovation—plastic suction pickup fabric —is reported by the author to have shown such good promise that his Japanese company is mounting the fabric on a production machine.

Akitoshi Kitano,
Technical Section,
Jujo Paper Mfg. Co., Ltd.
Tokyo, Japan

The familiar problems with vacuum pump capacity, pickup felt length, felt cleaning, felt wear and felt changing on suction pickup installations have prompted the author to design a new pickup transfer using a plastic fabric in place of the traditional felt. The plastic fabric was tested successfully on a 28-inch wide experimental fourdrinier machine (Figure 1) at Kyoto University. Writes Mr. Kitano "We are now planning an actual operation with the plastic pickup fabric on No. 3 paper machine at our Jujo mill." The following is a resumé of Mr. Kitano's experiences with his new fabric, as he reported them to Paper Trade Journal.

The plastic pickup fabric used on the experimental machine was plain-woven of polyethylene filaments according to the following specifications:

Mesh	—	80 openings per inch
Length	—	18 ft., 0-7/16 in.
Width	—	3 ft., 3-3/8 in.

The experimental fabric, with a stitched seam, was supplied by the Nihon Wire Works. In a conversation with a felt engineer, it was thought possible to weave a plastic fabric endlessly on a felt loom. This possibility is being examined further.

It is recommended that the mesh of the plastic fabric (80-90) be higher than that of the fourdrinier wire, and made of filaments of 200-300 denier. The edges of the fabric are strengthened with wire.

The suction pickup roll and the pickup framework were manufactured at the Hiroshima mill of Nippon Seikojo Co. Suction on the pickup roll was facilitated by a Nash 4-inch vacuum pump. The Toyo Rayon Co. supplied the "Pylen" polyethylene material. The use of other materials, such as Nylon, Salan, etc., are interesting problems for further research. Patents are pending on the pickup installation using a plastic fabric.

• Suction pickup roll. This is covered with rubber, and hole diameter is as small as possible. The suction box is a double compartmented device, with the narrower first compartment covering the area of the roll in contact with the wire. The front sealing strip is positioned at the point where fabric first contacts the wire. As was discovered in the test runs when the sealing strip was in advance of the contact point and when carrying only 10-12 inches vacuum on the roll, the sheet jumped up to the fabric and its structure was seriously impaired. The rear sealing strip is positioned at the point where the sheet leaves the pickup roll.

In the test runs, it was found that the driven pickup roll would considerably dewater the sheet at vacuums up to 8 inches Hg. A conventional felt on the experimental machine requires 20 inches vacuum on the suction pickup. Thus, when a plastic fabric is used, a smaller capacity

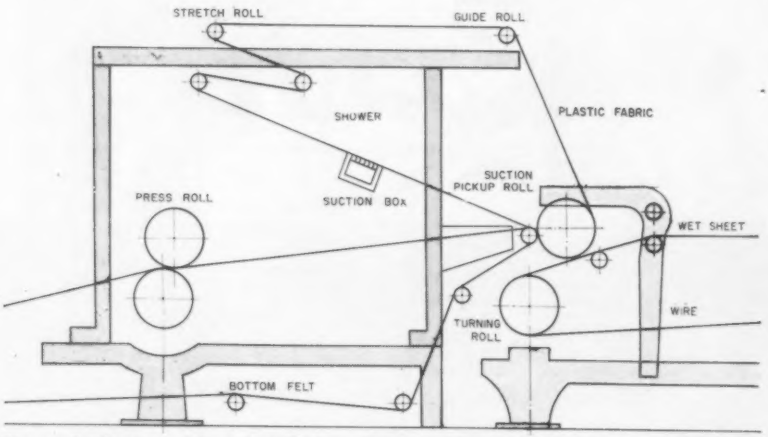

Figure 1: Suction pickup installation clothed with a plastic fabric on the experimental machine at Kyoto University.

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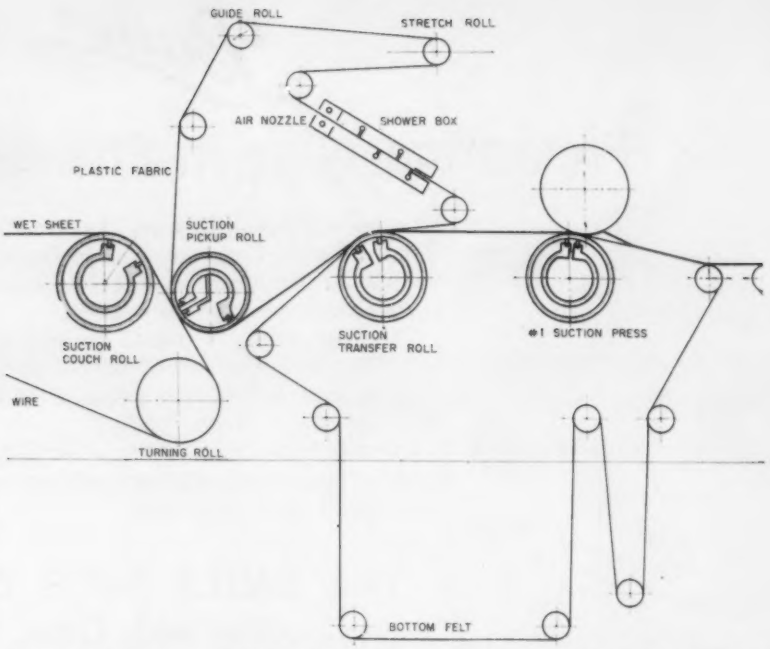

Figure 2: How suction pickup using a plastic fabric is installed on an actual production machine. Note the author's method of transferring the sheet from the pickup fabric to the press felt.

vacuum pump and motor can be installed on the pickup roll.

• Cleaning. The suction wringer roll and its drive motor and vacuum pump is eliminated. It is sufficient to install a simple shower box just after the point of transfer of the sheet to the first press bottom felt, as shown in Figure 2. After washing, the fabric should be blown clear of water with air nozzles.

• Guiding. Because it has less tendency to fill with dirt, and is easy to clean, the plastic fabric can be shorter in length than a felt. Consequently, the fabric will have a higher frequency of revolutions, and therefore, needs to be precisely guided.

• Tensioning. The tension of the plastic fabric has to be regulated with a stretch roll enough to smooth out wrinkles. Some wrinkles have no affect on the fabric's practical use, but strong folds injure the sheet's structure.

Figure 3 shows a triple-woven seam of a 40-mesh fabric. Tensile strength tests on the joint indicated 27.6 lbs. per inch. If the joint is, in addition, stablized by heat, its strength will increase by 6.6 lbs. per inch. In practice, it is hardly necessary to apply this tension load on the fabric with the stretch roll.

In the experimental runs, the fabric swelled and was stretched by stock piled on the surface of one of the rolls. However, the fabric returned to normal after passing over the roll, without distortion or breaking of the fabric.

• Mounting. Because the plastic fabric has great elasticity, it does not require special handling procedures nor special mounting apparatus.

• Performance. The plastic net picks up the wet sheet from the wire positively; and sheet structure is not impaired or destroyed. The life of the plastic fabric is longer than the conventional pickup felt.

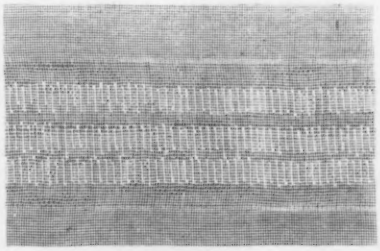

Figure 3: Photograph of a section of 40-mesh plastic fabric showing triple-weave seam. Mesh is approximately double in photo due to reduction to about one-half of actual size.

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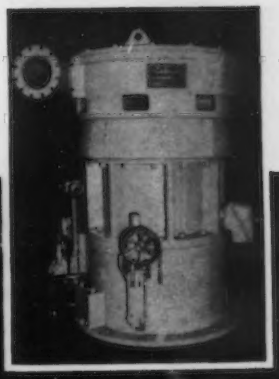

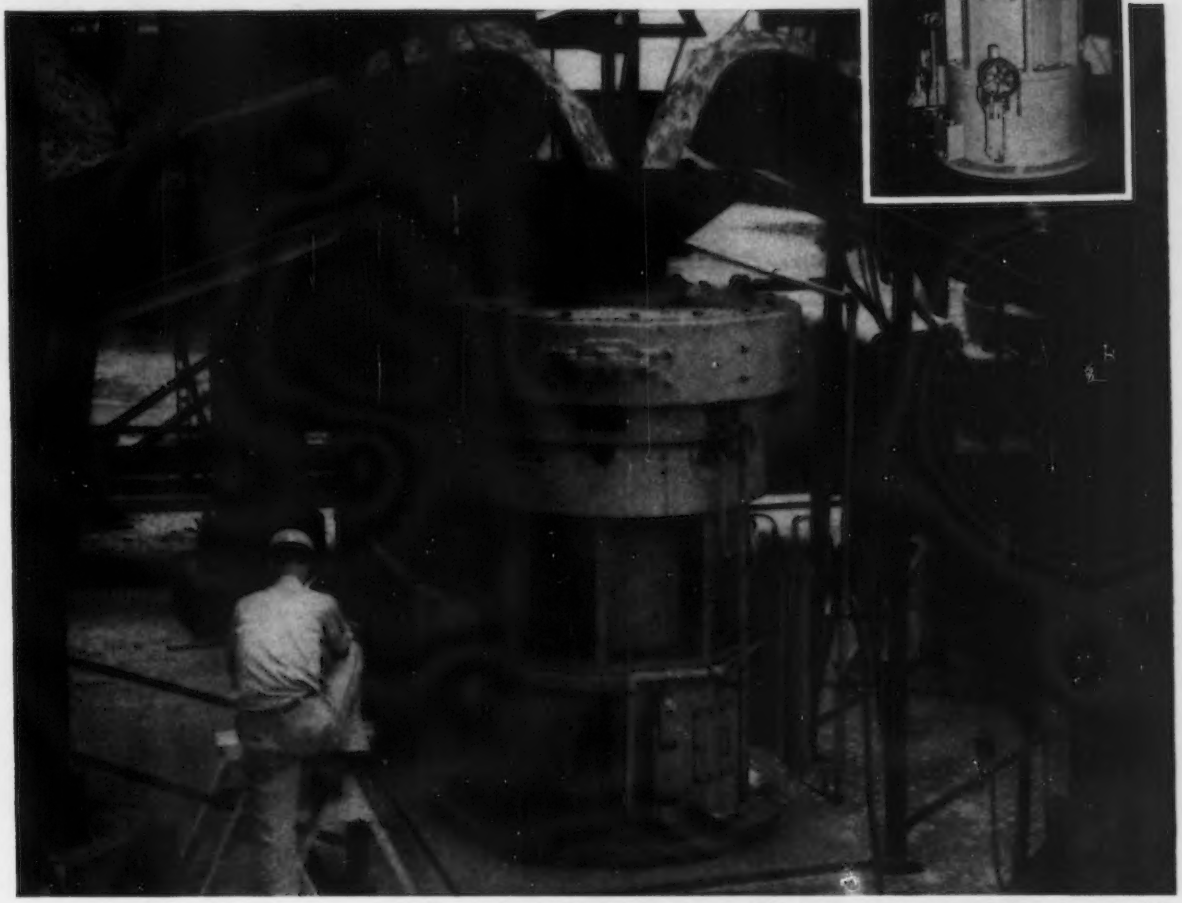

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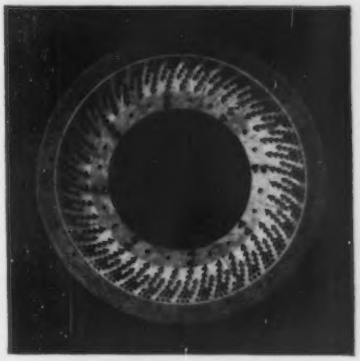

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PJT NEWS OF CONVERTERS

Sefton Fibre Can Names Division Sales Manager

William A. Vandivere has been appointed assistant sales manager of the Fibre Can Division, Sefton Fibre Can Co. He will be headquartered at the company's main office in St. Louis.

Mr. Vandivere joined Sefton, a division of Container Corp. of America, in 1958 as a salesman in the New Jersey-Philadelphia area.

O-I Paper Products Advances Bower

David N. Bower, Toledo, Ohio, has been named assistant to the general manager of the Long Island City and Newark box plants of Owens-Illinois Paper Products Division.

Since joining Owens-Illinois in 1945, Mr. Bower has served largely in industrial engineering and research and development capacities. Immediately before joining the Paper Products Division he was in the field of sales and executive evaluation in the Administrative Division.

He will report to William Dailey, general manager of the Long Island City and Newark operations.

Raymond Bag Elects Hines V.P. and Director

Arthur W. Hines has been elected vice president in charge of manufacturing, and a director of Raymond Bag Corp., Middletown, Ohio, Division of Albemarle Paper Manufacturing Co., Richmond, Va.

Mr. Hines joined Albemarle in 1930. He formerly resided in Highland Springs, Va., before going to Raymond in Middletown in 1955 in the capacity of production manager.

O-I Chemical Picks Joliet Plant Manager

John H. Young has been appointed plant manager of the Joliet, Ill., container plant of the Packaging Division, Olin Mathieson Chemical Corp.

Mr. Young, who has been in the corrugated container industry for 17 years, was formerly product manager of the division's Cincinnati container plant. He joined Olin Mathieson in June 1959. Before that he was a plant production manager for the Hinde & Dauch Division of West Virginia Pulp & Paper Co.

C.C.A. Chooses Sales Mgr. For West Coast Division

Appointment of Sheldon L. Land as assistant general sales manager of Container Corp. of America's West Coast Division, is announced by J. G. Robinson, vice president. He will be headquartered at the company's San Francisco office.

PCA Gives Hamilton Sales Management Post

Charles L. Hamilton, formerly of Cincinnati, Ohio, has been appointed sales manager of Packaging Corp. of America's folding carton plant in Grand Rapids, Mich.

Mr. Hamilton was a member of the sales staff of Ohio Boxboard Co., one of PCA's three predecessor firms, for 11 years.

Albemarle Acquires Assets Of Armstrong Container

Albemarle Paper Manufacturing Co. has acquired the operating assets of Armstrong Container Corp., Baltimore, Md. Armstrong, which manufactures a wide variety of corrugated paper shipping containers, began operations in June 1958.

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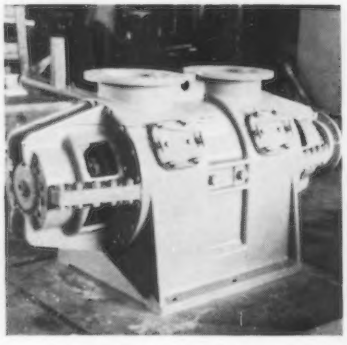

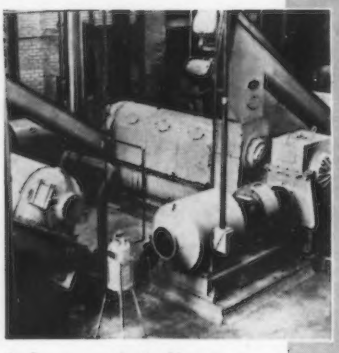

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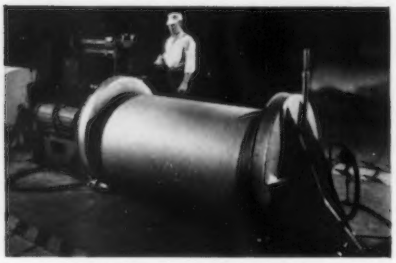

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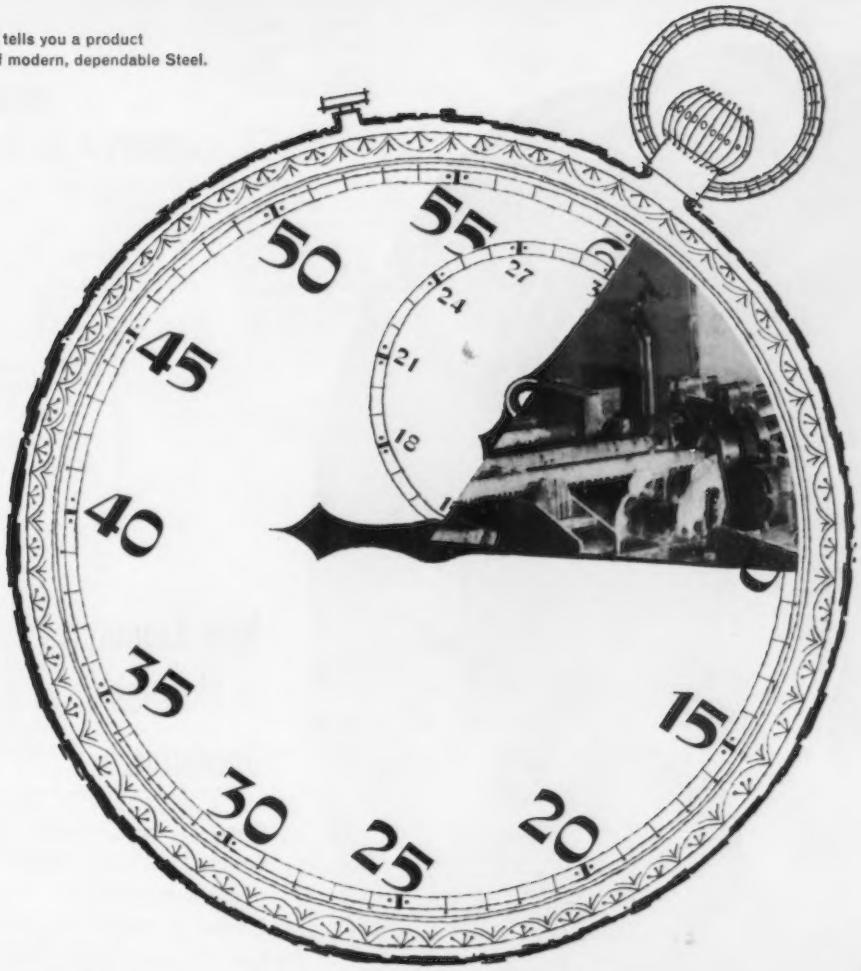

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New Economies in Flat-Belt Operation

Tanastic, the nylon core leather belting by Rhoads, makes no maintenance demands. Will not slip because it is stretch-free. Maintains tension, runs straight and true. Tanastic starts up without slipping, and runs at highest speeds required in mill operation.

Ask a Rhoads belt-drive engineer about Tanastic nylon core leather belting, Texalon nylon core synthetic belting, or famous Rhoads Tannate leather belting. Literature on request. Address Engineering Department, J. E. Rhoads & Sons, Wilmington 99, Delaware.

RHOADS

Established 1702 . . . Pioneers in Mechanical Power Transmission

PJT NEW LITERATURE

ABC of Pallet Handling

Illustrates different types of pallets and explains their uses. The advantages of wood and metal pallets are listed and pallet specifications are explained. Describes how to estimate pallet requirements by floor-area, weight and unit methods. Instructions for loading pallets are given and standard loading patterns are illustrated. Suggestions are offered for safe pallet operations. The handbook is being distributed without charge in the interest of better pallet handling. 15 pp. The Raymond Corp., 191-184 Madison Street, Greene, N. Y.

Screw Conveyor Drives

Lists the sizes available in relation to screw diameters and gives selection data. Type B features a trough supported motor base with jack screws, adapter bolted trough end, positive seal protection in adapter and reducer, precision gears and bearings. Folder 2718. Link Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

Mechanical Adjustable Speed Drives

Describes ¼-25 h.p. line of Polydyne mechanical adjustable speed drives introduced by General Electric. Discusses principles of operation, configurations and features, and includes mounting position, rating tables, and description of available accessories. Also discussed: the benefits of mechanical adjustable speed drives, and how to select and specify Polydyne units. Bulletin GEA-6806. 16pp. General Electric Co., Schenectady 5, N. Y.

Bulk, Liquid Material Handling Systems

"Tote, A Complete System to Solve Your Bulk Material Handling Problems" details the ramifications of the Tote System as an inplant and interplant system; as an automated system; as distinct storage units; discharge hoppers and shipping containers. Explains filling, discharging, storing, shipping, automating Tote Bins in almost any given plant situation. Contains a form for estimating costs versus savings. Also shows special applications and adaptations of both liquid and dry materials handling Tote Bins. Diagrams of construction of both Tote Tilts and Bins. Special-design Bins are introduced. Lists representatives and contains partial lists of companies using the system and dry and liquid materials now handled. Catalog No. 8. 32pp. Tote System, Inc., Beatrice, Neb.

Properties of Commercial Glasses

Details properties of 32 commercial glasses for engineers, designers and

(Continued on page 70)

The Pyrazol Fast range of Sandoz Directs is outstanding in fastness to light . . . outstanding in the other important properties as well . . . and is the prime choice in the coloring of nearly all grades of paper, from tissue to cover. For the booklet, complete with illustrations, that tells you all about Pyrazol Fast—write, wire, or 'phone: SANDOZ, INC. 61-63 Van Dam St., New York 13, New York. ALgonquin 5-1700. District Offices: Charlotte, Cincinnati, Fair Lawn, N. J., Hudson, Mass., Los Angeles, Philadelphia.

SANDOZ
THINKS AHEAD WITH PAPER
SANDOZ

Your nearby Sonoco core specialist offers personalized service...

Here's qualified assistance with your core problems from men who represent a company with over 60 years' experience in the field. They are located in each of Sonoco's coast to coast plants.

• Sonoco experience is coupled with research, and the result is found in the high quality and dependable service of the cores produced today. Sonoco cores are made to exacting torque and crush strength specifications in a completely integrated manufacturing operation. Quality is rigidly controlled from start to finish. Non-returnable cores; in all sizes. Returnable cores, with or without famous Sonoco metal ends, are made in all standard sizes. Sonoco can also supply a complete line of metal end core machinery and core cutters.

Regardless of your core needs, you'll get more for your core dollar from Sonoco in service, quality and economy. Call or write today!

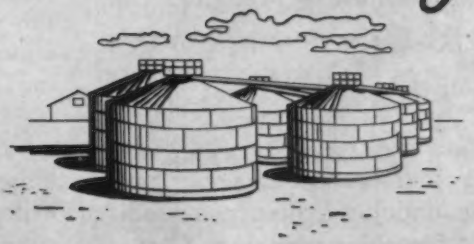
SONOCO
Paper Mill Cores
SONOCO PRODUCTS COMPANY

By every standard... WEST END MEASURES UP AS THE QUALIFIED SUPPLIER OF SALT CAKE

- ACCURATE PROCESSING OF ORDERS
- UNIFORMLY HIGH QUALITY
- ABUNDANT STORAGE
- FLEXIBLE AND EFFICIENT LOADING AND SHIPPING
- EXTENSIVE PRODUCTION CAPACITY
- VAST NATURAL SOURCE OF RAW MATERIAL
- ALL COMMITMENTS SCRUPULOUSLY MET
- FRIENDLY, HELPFUL ATTENTION TO INDIVIDUAL NEEDS
- PROMPT, AUTHORITATIVE ANSWER TO EVERY INQUIRY

However you view your needs, you will find in West End a unique coordination of specialized services, extensive production facilities and product excellence essential to the prompt, efficient handling of individual requirements.

Abundant storage



Vast reserves of finished products stored in extensive tank facilities are immediately available to meet any regular or emergency requirement promptly and easily regardless of market conditions. As West End increases production to serve an ever-expanding market for its products, storage facilities are constantly being enlarged to maintain the abundant level of chemicals in reserve.

Stauffer CHEMICALS SINCE 1885

75 YEARS OF SERVICE TO INDUSTRY AND AGRICULTURE

WEST END CHEMICAL COMPANY • DIVISION OF STAUFFER CHEMICAL COMPANY

636 CALIFORNIA, SAN FRANCISCO 8, CALIF. • PLANT: WESTEND, CALIF.

How Du Pont brighter pulp...save

Mechanical pulp bleaching...

A combination of peroxides can save up to $1.25 a ton over a hydrogen peroxide treatment.

Over 95% of all groundwood bleacheries have found that a combination of hydrogen and sodium peroxides cuts bleaching costs up to $1.25 a ton. The reason—combination formulas eliminate the use of caustic soda.

How is this possible? Because of the bleaching chemistry involved. When hydrogen peroxide is used alone, substantial quantities of caustic soda must be added to assure effective bleaching. But when sodium peroxide is part of the formula, caustic soda is formed, and additional quantities aren't needed. When caustic limits of this solution are reached, hydrogen peroxide is added to complete the balance, and the bleaching formula is now ready to use.

The charts below show the savings possible in a one-stage tower bleaching process when a combination of peroxides is used instead of a single hydrogen peroxide: For normal brightness, the saving runs from $.90 to $1.00 a ton; for premium brightness, $1.15 to $1.25 a ton.

You can obtain cold soda pulp and groundwood pulp brightness as high as 75 by this method. Cold soda pulp can be bleached in the refiner in absence of a bleaching tower with brightness gains up to 20 points.

For further information, get in touch with your Du Pont Representative listed at right.

EXAMPLE #1

ONE-STAGE TOWER PROCESS FOR NORMAL BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.2% "Solozone" sodium peroxide
0.7% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.2% NaOH
1.7% "Albone" 50 hydrogen peroxide

SAVINGS OF $.90 TO $1.00 PER TON BY USING COMBINATION OF PEROXIDES

EXAMPLE #2

ONE-STAGE TOWER PROCESS FOR PREMIUM BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.5% "Solozone" sodium peroxide
1.25% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.5% NaOH
2.5% "Albone" 50 hydrogen peroxide

SAVINGS OF $1.15 TO $1.25 PER TON BY USING COMBINATION OF PEROXIDES

Peroxides give you you up to $1.25 a ton!

Chemical pulp bleaching...

Peroxides—alone or in combination —give brightness up to 92 with excellent stability.

Mills throughout the country are finding that peroxides, alone or in combination, can give chemical pulp high brightness stability—without significant decrease in pulp strength or yield.

IN KRAFT BLEACHING, a five-stage process is producing outstanding results for a number of mills, among them a southern papermaker now producing over 100,000 tons of high brightness pulp annually. This process combines the best advantages of three bleaching agents—hypochlorite, chlorine dioxide and peroxide—to give brightnesses up to 90 with excellent brightness stability.

IN SULFITE BLEACHING, three peroxide processes are proving successful—a single-stage peroxide process which brightens pulp up to 75; a two-stage hypochlorite-peroxide process which brightens up to 86; a four-stage chlorine-caustic-hypochlorite-peroxide process which brightens up to 92. For information, call your Du Pont Representative listed below.

TECHNICAL SERVICE FOR YOU . . . Peroxides have a powerful bleaching action that produces high brightness pulp with excellent brightness stability. But it takes skill and experience to use peroxides efficiently. With Du Pont "Albone" hydrogen peroxide and "Solozone" sodium peroxide, you get the most authoritative advice and service available . . . from the manufacturer of *both* products.

Du Pont specialists can give you practical bleaching formulas for groundwood, cold soda, kraft and sulfite. They'll help you set up your bleaching operation, train operators, and check frequently to make sure your bleaching quality stays high and costs stay low.

Call your Du Pont representative listed below; he'll be glad to start a program to help you determine the advantages of Du Pont peroxides in your mill, or write: Du Pont, Electrochemicals Department, Peroxygen Products Division, Wilmington 98, Delaware.

MIDWEST AREA
W. L. Liike, Chicago, Ill. • INdependence 3-7250

WEST COAST AREA
P. E. Kiefer, Portland, Oregon • CApitol 7-1281

NEW YORK & BOSTON AREA
C. R. Lombard, NewYork, N.Y. • LOngacre 3-6440

SOUTHERN AREA
R.W. Hammond, Charlotte N.C. • FRanklin 5-5561

Or call: N. J. Stalter, Wilmington, Del • PRospect 4-4698

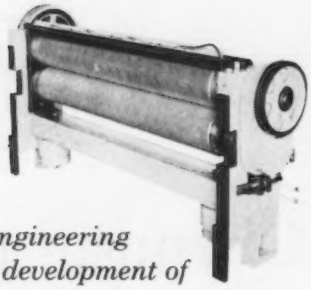
DU PONT PEROXIDES

ALBONE® hydrogen peroxide

DU PONT REG. U.S. PAT. OFF.

SOLOZONE® sodium peroxide

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



Creative engineering and development of converting machinery

A new embosser with matched steel rolls is the latest development from Paper Converting. Available as a separate installation or an attachment to rewinders, folders or printing presses, this new embosser features fully enclosed, oil lubricated herringbone gears and precision spherical roller bearings with tapered inner race arranged for hydraulic removal. Embossing rolls are air loaded with precision adjustable nip control, allowing for positive adjustment and accurate positioning, should the rolls be separated, then brought back together. Cleaning and lubrication of the rolls are automatic. If you are looking for the answer to *your* particular problem and desire the *exceptional* in converting machinery, contact Paper Converting . . . *now*.

PAPER CONVERTING MACHINE COMPANY • GREEN BAY, WISCONSIN

FOLDERS, REWINDERS, EMBOSSERS, NAPKIN AND CORE MACHINES, LETTERPRESS AND FLEXOGRAPHIC PRESSES, SPECIAL CONVERTING MACHINERY

Photo Courtesy of Gulf Oil Corporation

Gleaming Offset...on RHOPLEX-coated stock

This page was prepared for quality offset printing with a coating using a RHOPLEX 100%-acrylic emulsion binder. As a result, the surface is uniformly smooth. Halftone dots reproduce sharply, and colors print with superlative brilliance and fidelity.

RHOPLEX emulsions are excellent binders for coating not only paper, but paperboard as well. In fact, the excellent results produced by RHOPLEX coatings on both bleached and unbleached kraft board have been a boon to package design. The superb printing qualities conferred by RHOPLEX emulsions spark up colored printing on cartons for cigarets, beverages, frozen foods, and cosmetics. In coating paperboard, the low viscosity of RHOPLEX coatings permits coating application at exceptionally high solids, for maximum whiteness and hiding power. Other advantages include excellent flexibility of the dried coating, outstanding water resistance, calenderability at lower-than-average pressures, and very good adhesion. Write for our 16-page booklet "RHOPLEX Acrylic Emulsions in Paper Coatings" for formulating information and technical data on RHOPLEX B-15 and RHOPLEX B-60A coatings for printing papers and paperboard.

RHOPLEX *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

Chemicals for Industry

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

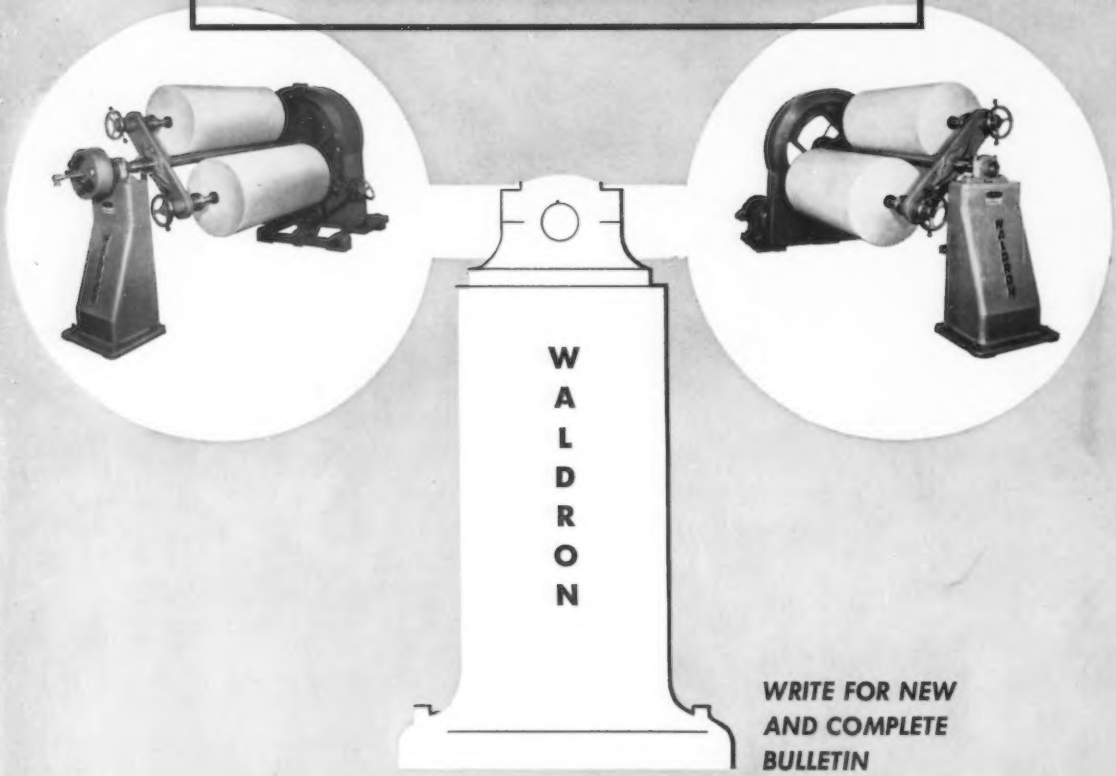
RHOPLEX

WALDRON

'TURNAREEL' Series

a new and advanced line of continuous

UNWINDS and WINDS



WRITE FOR NEW AND COMPLETE BULLETIN

LEADER IN WEB PROCESS ENGINEERING SINCE 1827

WALDRON-HARTIG DIVISION

MIDLAND-ROSS CORPORATION

NEW BRUNSWICK, NEW JERSEY

MT. PROSPECT, ILL. • LOS ANGELES

WEST COAST REPRESENTATIVE: BOJANOWER MACHINERY SERVICE CO.
5270 EAST WASHINGTON BOULEVARD, LOS ANGELES 22, CALIFORNIA

WM-260

PULP

Perkins-Goodwin Co.

Established 1846

PULP AND PAPER MARKETING-MANAGEMENT

589 FIFTH AVENUE, NEW YORK 17, N. Y.

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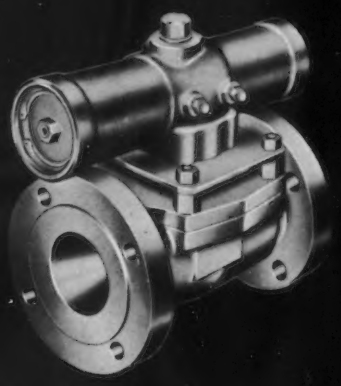
PAPER

Did a Pulp and Paper Man Design the *FLO-BALL* Valve?



In a way, yes. Hydromatics' design engineers went to pulp and paper mill men all over the country to find out just what they wanted in a valve. The result is the Flo•Ball, the only valve that answers all the valve problems peculiar to the pulp and paper field. Just check all these special advantages:

- **Low torque—no need to put persuaders on the Flo•Ball handle.**
- **Excellent for high consistency stock.**
- **Straight-through fluid path.**
- **Fast 90° on-off—you can see the Flo•Ball's position.**
- **Lowest leakage of any valve.**
- **Fits into any mill operation facility: pneumatic, hydraulic, electric.**
- **Ideal for groundwood, sulfite or sulfate mills.**
- **A wide variety of metals and elastomers handle chemicals like alum, black liquor, various clays, caustics, bleaches, dyes.**
- **Virtually no downtime, inspection. No special tools required—easy to disassemble and assemble right in the line!**
- **Two-way flow—seals perfectly in both directions.**
- **No lubrication.**
- **One-piece stem and ball—adds strength and precision.**

FLO-BALL

Write today for complete information.

Hydromatics, Inc.

LIVINGSTON, N. J. • WYMAN 2-4900 • TWX = LIVINGSTON, N. J. 120

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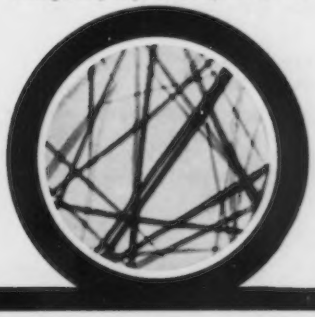
PAPELERA PULPA-CUBA S.A., TRINIDAD, CUBA

This new integrated pulp and paper mill produces 100 tons per day of high grade bleached and unbleached papers from sugar cane bagasse fiber. Our Organization supplied this project with technical assistance and the major production equipment including a Horkel System for depithing and cleaning the raw bagasse, a Pandia Continuous Digester and the Black-Clawson fourdrinier paper machine shown here.

Completely depithed bagasse fibers



NEW MILLS MAKING PAPER FROM BAGASSE AND STRAW

Wheat straw fibers

EMPAQUES DE CARTON TITAN S.A., MONTERREY, MEXICO

Under a package contract, we supplied principal equipment and start-up assistance for the recent expansion of this mill to produce 60 metric tons per day of unbleached wheat straw pulp for corrugating medium. Straw processing and pulping in a Pandia Continuous Digester is accomplished in this compact, semi-enclosed installation.

These Latin American projects are but two of the 25 pulp and paper mills throughout the world for which the Parsons & Whittemore-Lyddon Organization has provided full or partial planning, technical, economic, and construction services. Twelve different papermaking fibers are utilized among these projects. We even supervise start-up and train local operating personnel, and can arrange for sale of the output on world markets. For literature and full information on how our services can benefit your mill projects, write our nearest office.

THE PARSONS & WHITTEMORE—LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

18-19 Savile Row, London W. 1, England

5 Rue Jean Mermoz, Paris 8°, France

250 Park Avenue, New York 17, N. Y.

NEW LITERATURE

(Continued from page 61)

other technical personnel. Revised edition contains information on several new glasses as well as new sections on thermal expansion and optical properties. Also covers thermal stress, heat transmission, electrical properties, corrosion resistance and viscosity data. Several charts and graphs are included. Booklet B-83 (Rev.). 16pp. Request on company letterhead from Corning Glass Works, Corning, N. Y.

Rotary Vane Feeder Valve

Gives complete information on line of heavy duty, pressure tight, rotary vane feeder valves. The feeder valves are designed to close tolerance fits to handle 25 p.s.i.g. internal pressure and high vacuum, and to seal against a differential pressure of 15 p.s.i.g. across the rotary element. Bulletin 227. Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

Flexible Shaft Handbook

Features a simplified approach to the selection of flexible shafting through standard, pre-engineered, or custom-designed flexible shafts. Descriptive material, charts, tables and drawings are provided. Other hitherto unpublished data includes information on a simplified engaging system based on integral formed square drives, and the improved Series 7 (remote control) and Series 9 (power drive) flexible shafts. Describes advantages of flexible shafts, their function, successful applications, fundamental information on standard power drive and remote control shafts, uses of adapters and other accessories, and includes a section of tables and statistics valuable to the user or the potential user of flexible shafts. 4th Edition (Rev.). 89pp. Department P, S. S. White Industrial Division, 10 East 40th Street, New York 16, N. Y.

Power Transmission, Conveyor Equipment

Describes a full line of power transmission equipment and conveyor supplies. Included are new perforated open end belting, Super 358 Vee Belt Drives, Gear Motors, Fan Cooled Speed Reducers, Chain Drives, Conveyor Pulleys—as well as many other popular transmission items. Lists prices, specifications and engineering data. Catalog 103B. 68 pp. The Rockwood Pulley Mfg. Co., Inc., 20 Crosby St., New York 13, N. Y.

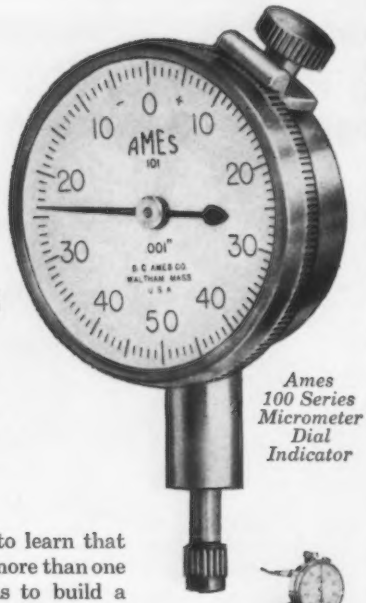
Railroad Chip Car Shakers

Describes one-man operated railroad car shaker incorporating a low-frequency vibration shaker mechanism for fast, economical unloading of hopper bottom cars at the rate of 8 to 10 an hour. Used for unloading wood chips and other bulk materials, it can be mounted anywhere along the length of the car, in single or multiple railroad track arrangements, with fixed or traveling hoists or cranes. Folder 2745. 6pp. Link-Belt Co., Dept PR, Prudential Plaza, Chicago 1, Ill.

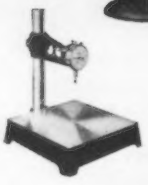
Waste Paper Symposium Proceedings

Proceedings of the First Waste Paper Symposium held in Chicago in June 1960. The Proceedings carry the 24 papers presented at this meeting which was the first of its kind ever held. A

AMES DIAL INDICATORS
are built by nonconformists



Ames 100 Series Micrometer Dial Indicator



Some people might be shocked to learn that in this day of automation it takes more than one hundred separate hand operations to build a single Ames micrometer. In many respects we are building and assembling these precision instruments exactly as we did fifty years ago.

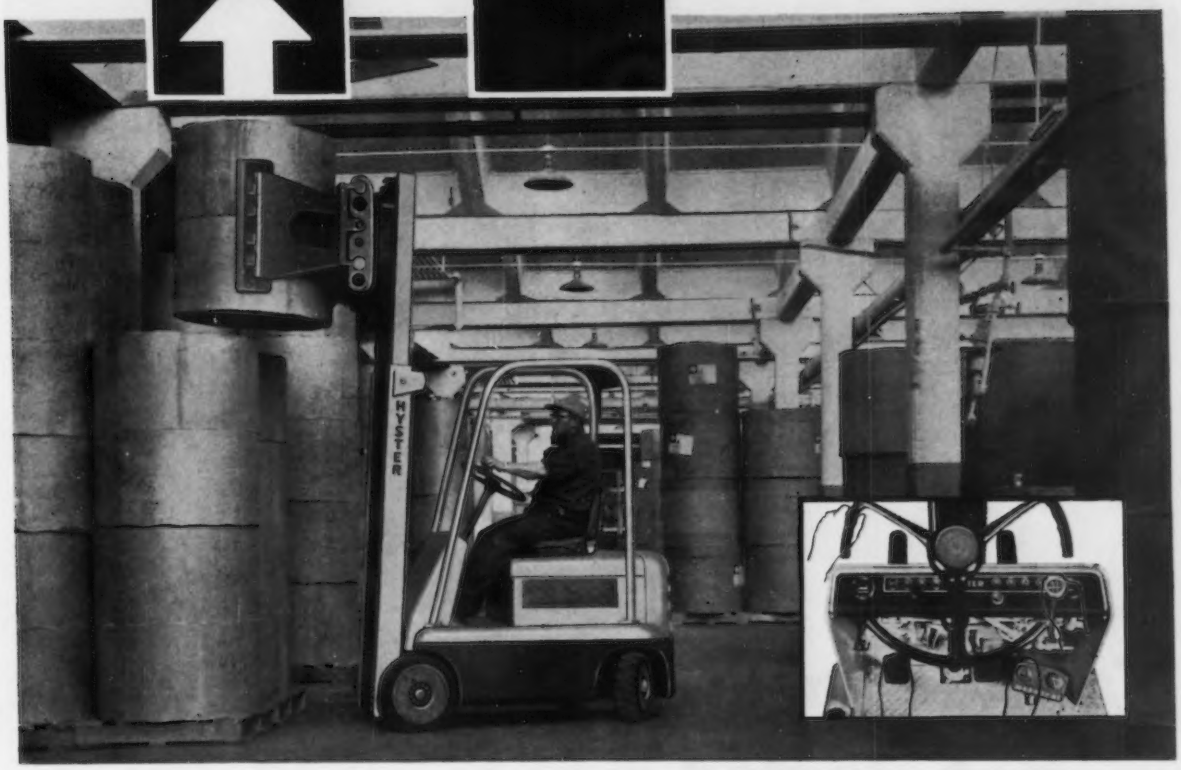
Why? Because there are some jobs that can still be done *better* by a pair of skillful, sensitive hands than by the best automated machinery made. As long as this fact holds true we'll refuse — for *your* sake — to follow the crowd. For Catalog No. 60 write to: B. C. Ames Co., 55 Ames St., Waltham 54, Mass. — in Canada, H. C. Burton Co., 166 Rebecca Street, Hamilton.

Representatives in Principal Cities

B.C. AMES CO.

MANUFACTURERS OF MICROMETER DIAL INDICATORS AND GAUGES
ACCU-FLOW AIR GAGES • TRANSISTORIZED COMPARATORS

HYSTER



Monomast high visibility upright—a Hyster exclusive.

monotrol for safe, fast handling — *Only* HYSTER® has it!

Move more tonnage per hour with Hyster lift trucks with Monotrol control.

All driving functions except steering are foot controlled—for smooth, natural coordination—safe, rapid handling.

Right foot Monotrol pedal controls power—forward-reverse—Hystamatic transmission. Left foot controls brakes and truck inching. Hands are free for steering and load control.

Safest, easiest trucks to drive. Quickest to service—cheapest to maintain.

Call your Hyster dealer or write for literature.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
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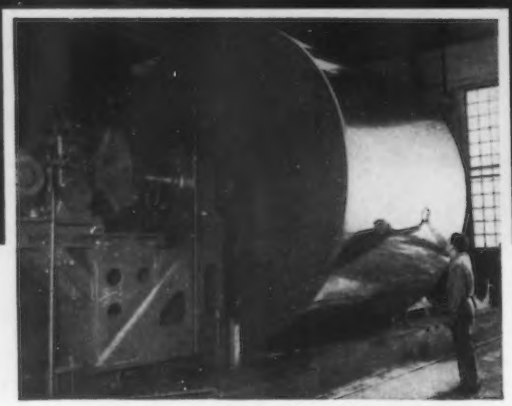
HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 • Danville, Illinois

Two fifty-thousand pound ladles pour the hundred-thousand pound casting for a large Yankee dryer roll.



The Newport News Yankee dryer roll takes a mirror-like finish.

Where

Yankee Dryer Rolls...and paper quality... get started right

Here in this foundry is where many a paper mill's *quality control* begins.

Here is where strength is born to provide steam-tight dryer rolls. And here, too, the fine grain of the metal is assured. That is important, as you know, since the finer the grain the higher the polish.

Desirable positions available at Newport News for Designers and Engineers in many categories. Address inquiries to Employment Manager.

Newport News has equipment for casting and machining paper mill rolls up to 12 ft. in diameter, and to 320 inches in length. Output is numbered in the hundreds. And deliveries are prompt. Your inquiries are invited.

NEWPORT NEWS
Shipbuilding and Dry Dock Company
Newport News, Virginia

wealth of information never before available on the subject of waste paper from the standpoint of the generator, the dealer and the consumer is included. Waste Paper Utilization Council, 122 E. 42nd St., New York 17, N. Y.

PVC Valves and Fittings

Describes the various Walworth valves and fittings available in corrosion-resistant polyvinyl chloride (PVC). A four-page Application Table rates PVC's effectiveness on over 300 fluids. Another section gives illustrated descriptions and dimensions of all Walworth's PVC valves (Y-globe, check, bleeder and diaphragm), strainers, unions, fittings and expansion joints. Circular, 16pp. Walworth Co., 750 Third Avenue, New York 17, N. Y.

Volumetric Feeder For Liquids

Gives a detail description of the Omega Rotodip Liquid Feeder and its operation, including a list of typical materials handled, a schematic drawing of a dry-materials-to-liquids proportioning process, as well as principal dimensions of the Rotodip. Bulletin 0065.20-1. B-I-F Industries, P.O. Box 1342, Providence 1, R. I.

Pneumatic Computing Relay

Describes the Sorteberg Force Bridge, a pneumatic computing relay. Detailed application data is listed for each of the computer's operations which include: multiplication, division, squaring, square root extraction, square root extraction with pressure compensation, simultaneous multiplication and division and ratio setting. Operation and design features are also described. Catalog 53 CR1000 8pp. Fisher & Porter Co. 547 Jacksonville Road, Warminster, Pa.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Aug. 27	Sept. 3	Sept. 10	Sept. 17	Sept. 24
1960	94.5	90.2	73.2r	93.1r	91.6
	Aug. 29	Sept. 5	Sept. 12	Sept. 19	Sept. 26
1959	95.4	96.2	78.0	98.5	97.1

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.0	97.0	97.7	96.2	81.3‡	91.8‡	—	—	—	—	—
1959	87.8	90.5	93.2	94.4	95.5	95.6	84.5	96.0	92.4	97.4	96.2	86.6	92.2*

‡ Preliminary. * Corrected.

COMPARATIVE YEARLY SUMMARIES

	1953	1954	1955	1956	1957	1958	1959	1960
Year to Date	94.2	91.3	95.3	98.3	91.1	86.4	92.0	94.1
Year Average	92.3	91.6	96.2	97.9	90.4	87.0	92.2*	—

* Corrected

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Aug. 27	Sept. 3	Sept. 10	Sept. 17	Sept. 24
1960	92	94	70	93	93
	Aug. 29	Sept. 5	Sept. 12	Sept. 19	Sept. 26
1959	96	97	76	98	97

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	93	—	—	—	—	—
1959	89	94	95	94	96	96	83	97	92	96	94	80	92

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Sept. 24, 1960	LAST WEEK ENDING Sept. 17, 1960	CUMULATIVE TO DATE Jan. 1, 1960 to Sept. 24, 1960
% Activity	93%	93%	91%
Total	321,633	320,971	11,711,029
Containerboard—Domestic Use.	168,658	172,028	6,040,692
Liner	115,477	115,954	4,047,090
Corrugating Material	48,418	51,720	1,800,679
Chip & Filler Board	4,763	4,354	192,923
Boxboard—Domestic Use	97,045	96,035	3,623,693
Folding	57,883	57,224	2,164,994
Set-Up	11,570	12,143	414,127
Special Food Board	27,592	26,668	1,044,572
Other Paperboard	55,930	52,908	2,046,644
Containerboard Type	26,533	23,527	976,800
Boxboard Type	29,397	29,381	1,069,844
Total Orders			
Received	312,753	312,608	
Unfilled End of Week	411,961	412,424	

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PJT NEWS OF SUPPLIERS

S. R. Roslund

R. M. Levine

H. Waterbury and Sons Co., Oriskany, N. Y., has appointed S. R. Roslund as West Coast sales representative. Mr. Roslund assumes the position with the firm previously held by his father, John Roslund, who passed away last February.

Prior to working as an associate with his father, Mr. Roslund completed an intensive training program at the Waterbury mill. He will represent Oriskany Waterbury Felts.

Borg Warner Corp., Washington, W. Va., announces that Ralph M. Levine has recently joined its Marbon Chemical Division as group leader in charge of coatings and latices. He was formerly associated with Vinyl Products, Ltd., England. Mr. Levine is a graduate of the University of Glasgow.

Ingersoll-Rand Co.'s Centrifugal Pump Division has announced the appointment of R. J. Bunch as manager. Also appointed to new positions were: G. T. Jones who was named manager of the Condenser Department; and T. E. Bennett who was appointed manager of the Engineering Pump Department.

Lamb-Grays Harbor Co. has announced the appointment of Norman F. Richards to the company's sales engineering staff. Mr. Richards, a native of Eugene, Ore., will be responsible for servicing Lamb customers on the West Coast of the U. S. and Canada. Formerly associated with Richards Manufacturing Co. Mr. Richards brings with him many years of experience in logging, plywood and mill machinery. He attended the University of Oregon.

N. F. Richards

F. L. McKone

Huyck Felt Co., division of Huyck Corp., Rensselaer, N. Y., announces the return of Francis L. McKone, who recently completed a tour of duty with the Air Force, as research engineer in the company's Felt Development Department. In his new assignment he will be concerned with developing new weaves in constructions as well as the modified use of synthetic fibers to improve a wide variety of papermakers' felts.

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New Edition of Pulp and Paper

The first volume in a revised and enlarged series of books on the chemistry and chemical technology of our industry by James P. Casey has been issued by Interscience Publishers. Pulping and Bleaching are the subject of the first of three volumes entitled **Pulp and Paper.** This 580-page (plus indexes) book is priced at $19.50. Our Russian friends should be interested to learn of this new edition. When the editor of this magazine was in Russia last year they showed him the Russian translation of the previous edition of this work. After the editor returned home he checked with the author, Mr. Casey, who was completely unaware of the honor done him.

The new volume, like its predecessor provides a good sound general technical book on the subject. However, we doubt that the different pulping methods are gone into in sufficient detail for anyone desiring more than a broad picture of the technology. It would be wished that in up-dating this edition greater effort had been made to cover the newest developments. In discussing continuous digesters, there is no reference to three new types, all of which have been in operation for several years. Cold soda pulping, the newest and fastest growing pulping process receives only 2¼ pages. In sulphite pulping the very significant developments in two-stage pulping are barely mentioned. The Sivola process gets one sentence as a proposed process, and the Stora Kopperberg process is not mentioned at all. Both these pulping methods have been in commercial operation for a number of years and have stirred up much interest on this continent. High yield kraft pulping receives only brief reference and the very significant Canadian development of high yield sulphite pulping, with ten mills using it and as many more planning to, receives no mention at all.

The above notwithstanding, we have no hesitation in recommending this book to those wishing a moderately detailed introduction to the technology of pulping and bleaching. Copies may be ordered from the Book Dept., Lockwood Trade Journal Company, 49 West 45th Street, New York, 36, N. Y.

Keep your eye on our Classified Advertising Section

Prices of Fibers

MARKET WOOD PULP

FOURTH QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$ 82.50/ 90.00	$82.50/ 90.00	§890.00/ —	§880.00/ —	§890.00/ —
Bleached Gw'd	$ 97.50/100.00	$97.50/100.00			
Kraft, Blchd.	‡152.00/160.00				§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		140.00/ —		
Kraft, Semi-bleached.	140.00/145.00				
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡150.00/155.00	‡150.00/155.00	*155.00/ —	*155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*135.00/ —	
Sulphite, Unb'l. Gl'an		140.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances.
‡ Depending on Brightness.

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F.O.B. OIL MILLS
WEEK ENDED SEPTEMBER 20

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	$8.00/7.75	n.a.	n.a.	8.25/8.00
3	7.75/7.00	$7.75/7.50	$7.50/7.00	7.75/7.00
4	7.00/6.25	6.50/6.25	6.50/6.25	6.50/ —
5	6.25/5.75	6.00/5.75	6.00/5.50	6.00/5.75
6	5.75/4.75	5.25/5.00	5.25/5.00	4.25/3.75
7	4.75/4.00	4.50/4.00	4.75/4.00	3.50/ —

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	Sept. 26	Sept. 26	Oct.	Oct.
No. 1 Mixed Paper	$ 7.00/ 9.00	4.00/ 7.00	6.00/ —	12.00/ —
No. 1 News	12.00/ 13.00	11.00/ —	13.00/ —	12.00/ —
Overissue News (Lg. size)	11.00/ 13.00	9.00/ 11.00	18.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	9.00/ 11.00	9.00/ —	13.00/ —
Old Corrugated Containers	19.00/ 20.00	17.50/ 18.00	20.00/ —	20.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	55.00/ —
New Double Kr. Ld. Corr. Cuts	32.50/ 35.00	37.50/ —	35.00/ —	35.00/ —
(Semi-chem. medium)	47.50/ —	40.00/ 47.00	— / —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	57.50/ —	— / —
New Br. Kraft, Env. Cuts	70.00/ 75.00	70.00/ 75.00	52.50/ —	60.00/ —
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 65.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Unprintd.	60.00/ 65.00	65.00/ 70.00	60.00/ —	60.00/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	23.50/ 27.50	15.00/ —	32.50/ 35.00
White Newsblanks	42.50/ 45.00	47.50/ 52.50	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	60.00/ 65.00	60.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	90.00/100.00	85.00/ —	95.00/ —
Hd. White Env. Cuts	100.00/105.00	110.00/115.00	90.00/ —	113.00/ —
Col. Tab. Cards	42.50/ 45.00	50.00/ 57.00	45.00/ —	40.00/ —
Manila Tab. Cards	62.50/ 65.00	60.00/ 70.00	65.00/ —	65.00/ —
No. 1 Col. Ledger	32.50/ 35.00	32.50/ 37.50	40.00/ —	27.00/ —
White Ledger	45.00/ 50.00	47.50/ 52.50	50.00/ —	85.00/ —
Mixed Book & Mag.†	— / —	— / —	12.50/ —	— / —
No. 1 Books‡	16.50/ 19.00	22.00/ 24.00	27.50/ —	10.00/ 12.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

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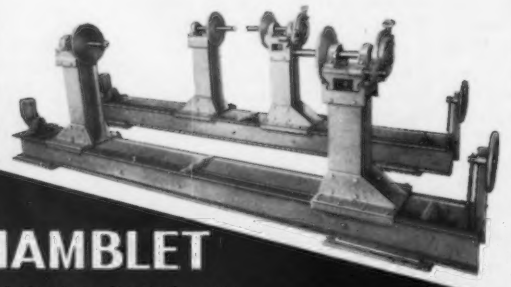

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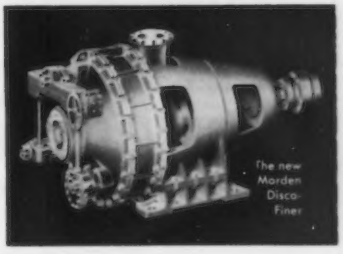

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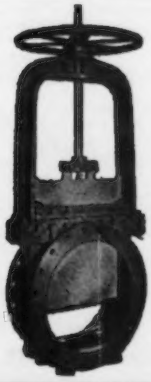

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1—60" 4-color W & H Flexo Press
1—51" 3-color Flexo Press
1—42" 4-color Cottrell Heinrich Flexo Press
1—42" 4-color Hudson Sharp Central Impression Cylinder Flexo Press
1—42" 4-color Crawford Flexo Press
1—40" 6-color W & H Flexo Press
1—40" 4-color W & H Flexo Press
1—33" 6-color Modern Clipper Flexo Press
1—33" 4-color Wolverine Hydro-Printer
1—32" 4-color Schmutz Bag Press
1—25" 3-color Potdevin Flexo Press
1—24" 2-color Manhasset Flexo Tailprinter
1—24" 5-color Kidder Celloprinter
1—22½" 3-color Chambon with Die Cutter
1—14" 4-color Waldron Gravure Press

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	50"-Precision	44"-C&P
	50"-Mod. "CF"	44"-Oswego
84"-8Z	44"-Mod. "CF"	44"-10Z
75"-Oswego	40"-Mod. "CF"	38"-Oswego
64"-Precision	50"-C&P	32"-Oswego
57"-Oswego	50"-Dexter	32"-3Y

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1—102" #18
1—87" Type 12
1—72" 10-11 & 1—72" 10-10A
1—62"—28-3BT
1—52" & 1—42" Model 24-7
1—50" 28-3D
1—42", 50" & 62" Type 6
1—32" and 42" 26-3A's

OTHER SLITTERS

2—82" Langston: 1—"BA" & 1—"B"
1—65" S & R (Similar Kidder Model C.W.)
1—60" & 1—40" Fales Model "C"
1—40" & 1—52" Fales Model "B"
1—60" Langston Type A
1—60" Inman With Reeves Drive
1—52" Moisel (Shear-Cut)
2—40" Beck Razor Blade Slitters
1—40" & 1—60" Kidder SH 40" rewind
1—40" Langston "Type A" (Shear-Cut)
1—24", 1—30", 1—36" & 1—40" Kidder S.L. & 1—36" SLN

MISCELLANEOUS MACHINES

1—Honsel Millinery Bag Machine (Model S-50) Wide Range & 3 Color Printer
1—(Round & Square) Butter Chip Machine
1—48" Schultz Rewinder
1—66" PCM Continuous Roll Winder
1—99" 3-Bar Towel Winders
1—2-bar Towel Roll Converter
1—Lawtomatic Towel Roll Wrapper
1—Hayssen Banding Mach. Mod. S-15
1—Std. Knapp Mod. 806H Case Packer
1—Battle Creek Poly Twin Toilet Roll Wrapper (New)
1—Facial Tissue Machine Complete
4—81" PCM Company's Tissue Converters
2—81" Dietz Tissue Converters
2—81" PCM Company's Towel Converters
1—Lawton Jr. Wrapper
1—34" Roto Bag Weldmaster side-welded Poly Bag Machine
1—Roto Model "C" Cello Bag Machine
1—Beasley French F&S Bag Machine
1—34" Waxer with 4-Ton Refrig. Unit
1—36" and 1—45" CCSH Beck Sheeter
1—78" & 1—94" M & W Sheeter & Layboy Hamblet Sheeters—32", 45", 64", & 104"
1—Simplex 7-24 Pouch Machine
1—Matador Model #31 Bag Machine
2—PO-5 & 1—PO-2 Roto Bag Machs.
1—Model 4-S & 1—Model 5 Potdevin Sack Machines
2—38" x 24" 4-Post Seybold Die Presses
5—Sheridans: 66" x 44", 60" x 30", 50" x 24", 44" x 22" & 36" x 18" and 1—Ford-Smith: 48" x 40"
Embossers 48", 38", 32" & 50" Heavy Duty Hudson Sharp Tinter-Embosser
1—55" Waldron Embosser
1—40½" Hudson Sharp Toilet Interfold

BARKING DRUM
1—12 ft. diameter x 45 ft. long

BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54" x 48", cast iron tubs.

CALENDER STACKS
1—3 roll 84" face
1—4 roll 72" face. (Extra heavy duty)
1—5 roll 82" face.
1—5 roll 86" face

CHIPPERS
1—96" Murray 4 knife Chipper—anti-friction bearings.
1—84" 10 knife Casthage Chipper. Anti-friction bearings, with motor

COATER
1—42" Chapman Extrusion Type Coater

CONSISTENCY REGULATOR
1—Poirier Stainless Steel, new condition

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
1—Williams Hammermill.
1—Jeffrey Shredder.

CYLINDER MOLDS
1—30" diameter x 72" face.
5—36" diameter x 75" face, with couch rolls
1—36" diameter x 82" face.
4—36" diameter x 90" face, with couch rolls.
1—42" diameter x 96" face
2—42" diameter x 106" face
2—60" dia. x 170" face.

DRIVES
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive.
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 H.P.)

DRYERS
1—16" diameter x 54" face (steel).
1—28" diameter x 84" face.
1—28" diameter x 48" face.
2—Calender Dryers, bronze, 30" x 128" with frames, gears & necessary rolls to make up the unit.
1—36" diameter x 44" face.
5—36" diameter x 76" face.
23—36" diameter x 84" face.
14—48" diameter x 48" face with bearings.
2—48" dia. x 52" face with frames, gears, bearings
2—48" x 60" face frames, gears & bearings
1—48" x 96" face.
6—48" diameter x 130" face.

EMBOSSING CALENDERS
1—43" 3-Roll Embossing Calender.
1—48" 2 roll Meadows Embossing Calender
1—51½" 3-roll Smoothing Calender.
1—57" 3-roll Embossing Calender.
1—62" 2-roll Embosser.
1—90" 2-roll Smoothing Calender.

FILTER
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump.

FLAT SCREENS
1—12 Plate "Packer"
4—14 Plate IMPCO, bronze vats

JORDANS
1—Jones Standard, new spare tackle, with 75 h.p. motor.
1—Noble & Wood Monarch, Type D, anti friction bearings.
1—Noble & Wood Baby Jordan, anti friction bearings, with 20 h.p. motor.
1—#6 Miami, anti friction bearings.

LABORATORY EQUIPMENT
1—4" face x 36" diameter Saveall
1—Washer for 5 lb. Beater.
1—24" Saveall, stainless steel.
1—20" Fourdrinier Wet End & Press Section.
2—8" x 8" Valley Sheet dryers.
1—12" x 12" Valley Sheet dryer.
1—18" x 20" Williams Sheet Dryer
1—15 lb. E. D. Jones Beater.
1—Noble & Wood Cycle Beater with motor & stand.
1—Greene Freeness Tester.
1—Cady Micrometer.
1—High speed Jordan, anti-friction bearings.
7—Mullen Testers, motorized.
1—2 qt. Auto Clave. Stainless Steel.
2—Elmendorf Tear Testers.
1—Hermann Disintegrator (new).
1—27" High Solid Coater.
1—Noble & Wood Baby Jordan, anti friction bearings, with 20 h.p. motor.

MISCELLANEOUS
1—Bird Centriffier built 1958, new condition
1—Shartle Hydrafuge, 1000 g.p.m. (with motor)
1—Nichols Vorject

MOTORS
4—25 h.p. Westinghouse, totally enclosed, ball bearing. 705 r.p.m.

PRESS ROLLS
2—Chilled iron, chrome plated 9" x 72".
1—Chilled iron, chrome plated 10" x 74".

PULPERS
1—#1 Jones Pulp Master.

PUMPS
1—Economy Fan Pump 6000 g.p.m., 20' head, 50 h.p. motor.

REELS
1—72" Downingtown Reel, 2 bowl.
1—84" 3 bowl revolving reel.
1—86" 2 bowl reel.
1—100" Rice Barton 2 bowl Reel, heavy duty.
1—116" Downingtown, 2 bowl, anti friction bearings.
1—123"—3 bowl Revolving Reel.
1—134" 2 drum.

REFINERS
1—Rice Barton Dynofiner, details on request.
1—12" Wiener Refiner, with 200 h.p. motor.
2—36" Bauer double disc #185E Refiners, each with two 100 h.p. motors.

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
4—#2A Bird Rotary Screens, copper vats.
7—Trimbey, Senior Knotter Screens.
1—#2A—50 Bird, copper vat.
2—APMEW Rotary Pulp Screens.

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1—#6 Bird Saveall.
1—24" Continuous Saveall, stainless steel.
1—LaMort 48" diameter x 82" face cylinder mold.
2—Savealls, cylinder molds, 42" diameter x 106" face, brand new vats.
2—Savealls, Rice Barton, cast iron vats, cylinder molds 48" diameter x 128" face, complete with 18" diameter couch rolls, all in very good condition.

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1—16" "Swift" Paper Shredder.

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1—26" Cameron Type 26-2A, complete constant tension & electric eye
4—42" Cameron Type 6.
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1—42" Cameron Type 40-2.
1—50" Cameron Type 6.
3—52" Cameron Type 9
1—62" Cameron Type 6
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84" Quick change slitting device shear cut, complete

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1—Downingtown suction couch shell only, 127½" face 26" diameter.

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1—Beloit, 36" diameter x 246" face, SKF bearings.

SUCTION FELT ROLL
1—Gilbert & Nash 122" face.

SUCTION PRESS ROLL
1—Sandusky 18" dia. x 138" face Suction Press Roll.

SUPER CALENDER STACK
1—9 Roll 56".

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1—72" Hudson-Sharp (Surface type winder).

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1—#4 Nash Hytor
1—#7 Nash Hytor, with 75 h.p. synchronous motor.
1—H-3 Nash.
1—K-5 Nash.
2—L-4 Nash.
3—L-5 Nash.
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O-10

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O-17

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O-24

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O-10

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O-24

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O-31

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O-10

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O-10

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FOR SALE

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O-17

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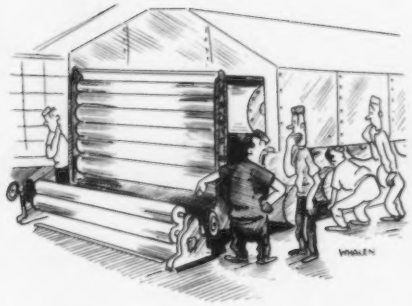

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1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, George E. Lockwood, 49 West 45th St., New York 36, N. Y.; Editor, John C. W. Evans, 49 West 45th St., New York 36, N. Y.; Managing editor, John C. W. Evans, 49 West 45th St., New York 36, N. Y.; Business manager, Arthur E. Gordon, 49 West 45th St., New York 36, N. Y.

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(Signature of Business Manager)

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Stafford House, Norfolk St., Strand, London, W.C.2.
Phone TEmple Bar 7397.

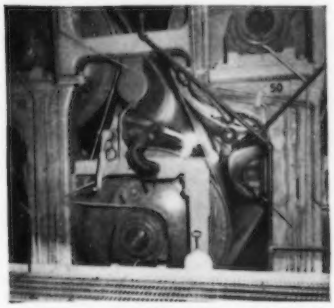
HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

union camp

No. 7 MACHINE

Savannah, Georgia

Note extensive window area in this Ross Totally Enclosed Hood



Ross Dryjector which delivers the air at the center of the sheet and directs it outward to the edge.

Highlight of Union Bag-Camp's "C Program" is the high speed No. 7 paper machine. For this up-to-the-minute, versatile machine, J. O. Ross provided the complete air system including the totally enclosed paper machine hood, the bottom felt dryer, two roof heating and ventilating units, two wet end exhaust units, two Ross Dryjectors, the calender cooling unit and the pneumatic trim conveyor.

Today, modern paper machines call for Ross Engineered Air Systems.

M-R

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A Division of Midland-Ross Corporation/730 Third Ave., New York 17, New York

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—as used to make better dielectric sheet at Johns-Manville, New York, N. Y.

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The problem was the standard-saturated asbestos dielectric sheet for transformers. It insulated well, but the solvents of one manufacturer's varnish system were not compatible with the saturant in the paper.

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